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THE JOURNAL
of the
South Carolina Medical Association

VOLUME XXXVII December, 1941 NUMBER 12

Sprue

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Better called chronic idiopathic steatorrhea and throughout my discussion the word sprue is chosen simply because of common usage and therefore simplicity. In selecting this subject, it was believed that it would be of interest to review the recent literature on this relatively uncommon condition in our state, and to report in some detail my experience with a few cases that I have seen during some eighteen years practice in South Carolina. If, by such a review, I can impress upon you a few of the salient features of this condition, which does occur in South Carolina and perhaps more often than I am aware, you will be more likely to think of the possibility and therefore make the diagnosis when confronted, at widely separate intervals, with this interesting and distressing syndrome, which is responsive to proper treatment.

Snell and Camp[1] list several synonyms for this clinical syndrome:

1. Non-tropical sprue.
2. Idiopathic steatorrhea.
3. Adult celiac disease.
4. Intestinal lipodystrophia.
5. Gee's disease.
6. Gee-Herter disease.

The condition is, to all intents and purposes, similar to tropical sprue, differing only in that it occurs in the temperate climates without previous tropical experience. One of America's foremost students of this subject is your distinguished guest speaker this evening. The subject of Sprue is fully covered by Dr. Hanes in the Oxford System of Medicine and I would refer you to his work for further study of the subject. The definition of sprue given by him[2] is a thoroughly satisfactory one—"Sprue is a chronic deficiency state with a marked tendency to remissions and relapses characterized, when fully developed, by glossitis and stomatitis, anorexia, gastro-intestinal indigestion, by the passage of large fatty, frothy, foul smelling stools, by great weight loss, generalized muscular wasting and, in adults and some children, by macrocytic hyperchromic anaemia."

The history of sprue is of interest and recently an article on the subject by Miller and Barker[3] was prefaced by a verse from the Bible. It is interesting to search for evidence in the old classics for descriptions of disease. The authors quoted Job 30-27: "My bowels boiled and rested not. The days of affliction prevented me." Any of you who have seen a severe case of sprue in relapse will thoroughly sympathize with Job, for he may well have had it.

In a recent publication of Ashford's Bibliography of Sprue with Additions, by Dr. Hanes[4], he quotes from the writings of Aretaeus of Cappodocia, who practiced in Rome during Nero's reign in the second century A. D. This description of patients with diarrhea, which is bad in color, smell and consistence, and with associated atrophy of the body, is a classic and Dr. Hanes says that one can hardly doubt that Aretaeus was

describing patients with sprue. This will be found in the Puerto Rico Journal of Public Health and Tropical Medicine of June, 1938.

The more modern history[2] of sprue begins with a description of the disease by William Hillory in 1776. His observations were made in the Barbadoes. The term sprue—from the Dutch "sprouw"—was first used by Ketelaer, who, in 1669[4], wrote of cases of aphthous stomatitis accompanied by feces so voluminous that "several basins or pots scarcely held these accumulations." The really classical descriptions of this disease complex came in 1880 when Sir Patrick Manson in China, and VanderBurgh in Java published their studies. Manson recognized that an inadequate diet was of etiologic importance.

The late Dr. E. J. Wood[5], of Wilmington, North Carolina, wrote extensively about sprue in the United States. He stated that Dr. St. J. B. Graham, of Savannah, reported in 1905 four cases of sprue that originated in Georgia. My first case was seen in Florence, S. C., in 1921 and was the subject of some delightful correspondence with Dr. Wood.

The late Colonel Bailey K. Ashford, of the United States Army Medical Corps, wrote voluminously on the subject. He always believed that the monilia psilosis, commonly found in the stools of tropical sprue, was of etiologic importance, even if its role were only that of a secondary invader.

Etiology.

It is now generally believed, and the evidence seems definite, that sprue is a deficiency disease. The exact etiology is not known but recent work by Miller and Rhoads, whereby they have produced in hogs, by feeding a deficiency diet, a state closely resembling sprue, seems to establish the etiologic relationship with a deficiency state.

Hanes[2] suggests that the deficiency state in sprue may arise in one of the following ways:

1. Deficiency of the extrinsic factor.
2. Defective gastric digestion due to deficiency of the intrinsic factor.
3. Poor absorption from the intestine.
4. Deficient storage by the liver.
5. Or by a combination of several of these factors.

Haden[6] says a "nutritional disease is due to an inadequate supply, absorption, or utilization of vitamins, mineral salts, or nutritional factors normally formed in the body from food elements."

The characteristic steatorrhea of sprue is due to an inadequate absorption of fats by a damaged intestinal mucosa. Barker and Rhoads[7] have apparently established this fact by sound laboratory investigations. By determining the total blood lipids at two, four, and six hours after a meal containing two grams of fat per kilogram they have shown that the total blood lipids remain almost unchanged in active sprue before adequate treatment and that the same patients show a normal blood lipid response to the same meal after treatment. The failure of the lipid content of the blood to increase in sprue must be due to a failure of absorption by the intestinal mucosa, for there is no undue motility through the small intestine in sprue. They, therefore, conclude that the diarrhea of sprue results from the malabsorption, rather than the malabsorption from diarrhea. Their studies further indicate that the improvement from liver extract is due to some specific effect in converting a malabsorbing intestine to one of more normal function.

Wilbur and Snell[8], in discussing deficiency states associated with gastro-intestinal disease, define sprue as "A clinical syndrome characterized by stomatitis, fatty stools, emaciation, and disturbances in the metabolism of calcium, with hypocalcemia, osteoporosis and, at times, tetany." Cowgill[8], in discussing this paper, reports some interesting laboratory observations on vitamin deficiency diets. He offers the thought that certain experiments indicate the possibility that different clinical pictures, different symptom complexes, may be due to the same fundamental cause, as: dogs subsisting on diets markedly deficient in vitamin G—riboflavine—develop profound collapse after about one hundred thirty days. This collapse may be treated successfully and with striking results by the parenteral administration of riboflavine, the animals recovering sufficiently in about six hours to stand and, on the following day, they are able to run around and ap-

pear to be normal. On the other hand, dogs receiving the same basal diet plus one-half the daily amount of riboflavine found adequate to maintain normal health, never exhibit this collapse and live more than twice as long as the "acute" animals, but they do develop a true ataxia associated with spinal cord degenerative lesions. Cowgill wonders if these two results—namely, acute collapse without ataxia characteristic of the "acute" deficiency state and the ataxia exhibited by the dogs on the less deficient diet—both evidently due to the same dietary deficiency operating to a different degree, may not explain some of the controversial interpretations now given various symptoms.

Pathology.

The morbid changes found in sprue have been variable and often slight. No clear cut pathological picture is accepted as characteristic of this disease. The gastrointestinal tract has naturally been the point of major interest. Most reports have indicated chronic inflammation of the duodenum and jejunum. The intestines are often thin and atrophic and show no more change than is compatible with a deficiency state. No acceptable evidence of specific infectious origin has been produced. Mackie and Fairley (quoted in 9) believe that sprue is primarily a disease of the intestinal tract which, if progressive, results in degeneration and destruction of the absorbing and secretory tissues as evidenced by degenerative and atrophic changes throughout the small intestine.

Clinical symptoms.

Variability of clinical symptoms and a tendency to relapse and remission are the rule. Variability is due to the fact that in some cases the blood changes are striking; in others the gastro-intestinal symptoms are conspicuous; and in others the disturbed calcium metabolism dominates the picture. A careful history will usually reveal a diet badly balanced, probably an excess of fats and starches and poor in qualitative proteins. In our state we would expect such a diet to result in pellagra and unless we are careful such a confusion might occur. Sprue may appear as a complication in a patient debilitated by chronic infections, such as amoebic dysentery, or it may develop in a person in apparent good health.

The characteristic symptoms are:

1. Steatorrhea. Gee[2] described the characteristic stool perfectly. He wrote, "Signs of the disease are yielded by the feces; being loose, not formed, but not watery; more bulky than the food taken would seem to account for; pale in color, as if devoid of bile; yeasty, frothy, an appearance probably due to fermentation; stinking, stench often very great, the food having undergone putrefaction rather than concoction."

2. Gastro-intestinal. The onset may be slow, with flatulent distress and one or two such stools a day, or it may be acute, with severe distress, stomatitis, glossitis, profuse diarrhea and rapid emaciation. Anorexia is ofter troublesome, and vomiting may occur. The tongue becomes beefy red and eating painful. Later the tongue becomes atrophic and bald, like that characteristically seen in pernicious anaemia. As a rule the gastrointestinal symptoms are directly proportionate to the severity of the disease.

3. Loss of weight. In severe cases emaciation may become extreme. Ashford[2] says that "Sprue literally dissects its victims." Their skin becomes brownish and lustreless and Hanes[2] compares their color to that of a rusty grape-fruit.

4. Anaemia. In the milder and in early cases there is usually a hypochromic, normocytic anaemia of variable degree. In the severe case and in relapse the anaemia is more often hyperchromic and macrocytic, which is one evidence that has made it seem related to pernicious anaemia.

5. Defective calcium metabolism is the result of the long continued loss of calcium salts through defective absorption. Osteoporosis and tetany may occur in the severe cases. Hypocalcemia is the rule in active sprue. In severe cases occurring in childhood dwarfism may result. According to Telfer[10] the absorption of calcium occurs in a relatively small area of the duodenum and jejunum, which is significant in view of the known anatomic lesions in sprue. Clinical evidence of the lesion in this part of

the small intestine will be found on roentgenologic examination.

Laboratory features.

1. Anaemia—as described under clinical symptoms—hypochromic in early and mild cases and hyperchromic and macrocytic in severe cases. A very high color index often occurs in sprue.

2. Achlorhydria gastrica is not a constant finding. It is probably no more often found in sprue than in any series of patients of similar age groups.

3. Blood sugar studies. In sprue there is a low fasting blood sugar and after a glucose tolerance the curve is flattened. Hanes[2] says that a rise of more than forty milligrams above the fasting level is most unusual. This is important in differentiating the severe steatorrhea of sprue from pancreatogenous steatorrhea. In the latter there is usually a diabetic-like glucose tolerance curve and frequently an associated glycosuria.

4. Stools. There is an excess of fats, both neutral fats and fatty acids.

5. Blood calcium, phosphorus, and cholesterol are usually reduced in sprue.

Roentgenologic features.

In the past few years several workers have called attention to definite changes in the upper small intestine demonstrable on X-ray examination [9, 10]. These changes probably result from a deficiency state and are not of necessity diagnostic of sprue. Their intensity and extent vary directly with the severity of the clinical picture. Mackie et al[9] have reported their observations before and after treatment with liver extract and have demonstrated regression under such specific therapy. I have been able to confirm their results in my own small series.

The X-ray changes noted are:

1. Variation in contour and caliber of the intestinal lumen.

2. Abnormal motor activity with frequently a segmented distribution of the barium.

3. These changes may be localized or spread throughout the small intestine.

4. In the duodenum the mucosal folds appear thickened and the lumen irregularly dilated.

5. In the jejunum the valvulae conniventes are thickened and irregular in size, giving a distorted mucosal pattern. The jejunal lumen also appears dilated in segments and the barium is seen in sausage-like masses, smooth and large, with adjacent segments quite empty. The motor activity is not increased through the small intestine.

Differential diagnosis.

The condition most apt to be confused with idiopathic steatorrhea is pancreatogenous steatorrhea. In both there is marked weight loss associated with typical stools. There are differential features, however, that will usually establish an accurate diagnosis. The essential difference of course is that in pancreatogenous steatorrhea there is an absence of pancreatic juice in the duodenal contents, whereas in sprue pancreatic juice is present in normal amounts. In sprue the fats are presumably properly split and are unabsorbed, and in pancreatic insufficiency the fats are not split and steatorrhea results. As a result of the absence of pancreatic juice the muscle fibers are not completely digested and are found in large numbers in the stools. Therefore, azotorrhea and creatorrhea occur in pancreatogenous steatorrhea and not in sprue. The other important differential point is the flat glucose tolerance curve in sprue in constast to the diabetic-like curve in pancreatogenous steatorrhea.

Pernicious anaemia should not cause much difficulty. There is not much weight loss and there is not the typical diarrhea and there is always achylia gastrica. In pernicious anaemia of long duration there are frequently associated spinal cord degenerative symptoms and these are uncommon in sprue[14] even of long standing or in severe relapse.

Pellagra differs in that there are the characteristic skin and mucous membrane lesions and, in severe cases, the mental symptoms. The glossitis and oesophagitis are more painful and salivation is a common symptom.

Amoebic dysentery is readily distinguished by the presence of blood and pus and entomoeba hystolytica in the stool. Several authors express the belief that a chronic amoebiasis may be followed later by the development of sprue.

Chronic ulcerative colitis of the Bargen type

presents an entirely different picture. The stools are small and contain much blood. Fever is often present. The pain is more severe and there is not the typical offensive, bulky stool. Sigmoidoscopic examination reveals an acutely inflamed mucous membrane. A barium enema shows a small, tube-like colon in contrast to an atonic and redundant colon in sprue.

Treatment.

Until recent years sprue was treated as well as possible by diet and various medications. One of my cases will illustrate the treatment followed in 1921. In 1926 Bloomfield and Wyckoff treated a case of sprue with the liver diet brought out a year or two before by Minot and Murphy. Their patient had a pernicious-like anaemia, and the result was most satisfactory. Within a few years their results were confirmed by others and it is now an established fact that adequate amounts of liver extract given parenterally will relieve sprue and that the patients can live in comfortable health with an adequate maintenance ration of liver extract parenterally. There are two important facts to remember, however; first, it takes much more liver extract to control sprue than pernicious anaemia and; second, the liver extract is best given parenterally. Five to ten cc. of liver extract daily for five to ten days will usually relieve the acute or severe picture and five to ten cc. at intervals of five to fifteen days will maintain a comfortable state of health. Each patient must determine his maintenance ration and the proper dose is the amount that will prevent the recurrence of flatulent distress and diarrhea. It should be given two or three days before symptoms return.

In the acute stage the diet should be one of high protein, low fat, and low carbohydrate content. Before the days of liver extract this was the basic factor of treatment. Now the diet can be fairly rapidly brought back to normal, as relief follows specific therapy.

Because of the calcium loss, it is well to give calcium with viosterol during the recovery period. If achlorhydria is present, dilute hydrochloric acid should be given. It is a deficiency disease and vitamins in liberal quantities are perhaps indicated until a well balanced diet has been tolerated long enough to feel confident no further deficiency is occurring. Perhaps the vitamins B complex and C and D are especially indicated. Such is the modern and proper treatment of sprue. I now want to describe in some detail my first case and the extraordinary diet which resulted fortunately in a lasting cure for him.

Case Reports.

No. 1. K. C. K.: White male, farmer, age 41 when admitted to the McLeod Hospital of Florence, S. C., in May, 1921. He complained of severe diarrhea, great loss of weight, and weakness. He had never been out of the Carolinas. Prior to an attack of influenza in March, 1920 he had always enjoyed excellent health. He lost some weight and had some diarrhea after the influenza, but by summer he was apparently well again. In September he again had diarrhea, which was not severe at first but which did not respond to the usual remedies. He was six feet tall and at this time weighed 185 pounds. The diarrhea continued through the winter and he lost weight steadily. When admitted to my service his weight was 107, a loss of 78 pounds in some six months. He described a painless, bulky, offensive diarrhea which was typical. He was having three to ten stools in twenty-four hours.

He had lost weight to the point of emaciation. The mouth was sore, the tongue bald, fissued and dry, and superficial mucosal ulcerations were noted in the mouth. Otherwise physical examination was negative. X-ray examinations of the chest and gastro-intestinal tract were reported negative. The laboratory studies reported urines repeatedly negative, stools reported an excess of fats and light in color and foul. No amoeba found. Gastric analysis showed an absence of free hydrochloric acid on fractional analysis. Blood Wassermann negative. Hemoglobin 35%, reds 1.05 million, color index 1.7, white cell count 2,100, on admission. The stained smear showed marked variation in size and color of the red cells, no nucleated reds, no abnormal white cells, and no plasmodia.

On reviewing my record of this case, the following note was found, written several days after admission, "The patient tells me that these stools occurred in the morning hours until he became bed-ridden. The sore mouth only began a few weeks ago. In the beginning he was able to work in the afternoons as he felt much better after the diarrhea stopped about mid-day. His mental condition is good. There is no skin nor nervous evidence of pellagra. The blood picture is that of pernicious anaemia, but the marked weight loss and absence of any red cell regeneration is against this. X-rays of the chest rule out tuberculosis.

The absence of bronzing, the marked anaemia, the mental activity are against Addison's Disease. The absence of amoeba and ova rule out such infestations. The stools are of a definite character and the diarrhea, the anaemia, the sore mouth, and the emaciation certainly suggest a diagnosis of sprue. I have never seen a case of known sprue and make such a diagnosis tentatively."

The patient was put on a diet of boiled sweet milk and buttermilk, ripe bananas, and rare steak. He began to improve rapidly, when, after adding three eggs daily to his diet, a setback occurred, which resulted in the lowest weight recorded—104 pounds on June 15. After withdrawing the eggs, he rapidly improved and diarrhea subsided. On July 5 he was discharged, weighing 118 pounds, with a diet of boiled sweet milk and buttermilk, eleven pints, bananas, thirteen, and steak, one pound a day. Dr. C. R. May of Bennettsville reported regularly and on July 23 the patient weighed 147 pounds and was doing light work. He was having one formed stool a day and had gained 43 pounds in 38 days.

Sixteen years later—October 2, 1938—Dr. May very kindly wrote that he had looked up the patient at my request. He is now fifty-eight years old and weighs 200 pounds. He considers himself perfectly well and reports that he has never had a recurrence of his trouble. Knowing that relapses and remissions are so characteristic of sprue, I wonder that this man has enjoyed seventeen years of good health without diet restrictions and without liver therapy. The diagnosis of sprue seems satisfactorily established. A copy of my records was submitted to Dr. E. J. Wood, then living, and he wrote, "The case fulfills more exactly all the requirements than any American case with which I am familiar" and he added, "Did I tell you that the Public Health Service is saying that there is no real sprue in this country and that its presence is an error or a vagary of mine?" That letter was written less than eighteen years ago and now the American bibliography of sprue is quite extensive.

Case No. 2.

Dr. B., a physician, age 47 when first seen in October, 1927. At that time he was overweight and had found an occasional glycosuria. His weight was 201 pounds. No digestive history other than a history of dysentery for a few weeks at twenty-three. No diarrhea since. Except for obesity and a mild diabetic state, his examinations were negative. His fasting blood sugar was 140 milligrams per cent and two hours after his usual lunch it was 200 milligrams per cent, with a slight glycosuria.

Next seen in 1933 with an acute subacromial bursitis. Weight then 189 pounds, blood pressure 145/100, no digestive distress. After reducing his intake of sweets he had lost ten pounds and had shown no further evidence of diabetes. Blood sugars then 86 milligrams per cent fasting and 115 milligrams per cent one hour after lunch. I wonder now if this low one hour figure was even then significant.

Next seen in February, 1935. For a year he had been very sick with diarrhea, anorexia, and had lost weight to the point of emaciation. He was bedridden and had been able to work only three months the preceding year. He had consulted several colleagues and various diagnoses were made. During the fall of 1934 the glossitis and anaemia were severe and a diagnosis of pernicious anaemia was made. His blood counts, reported by a reliable laboratory, had been as low as 2.8 million reds with a hemoglobin of 95 per cent, a color index of 1.7. The red cell counts ranged from this low to 4.9 million, always with a hemoglobin of 90 to 100 per cent. A gastric analysis in February, 1934 reported 62 points of free hydrochloric acid and another in December, 1934 reported an absence of free hydrochloric acid.

When seen at home in February, 1935 he had lost 67 pounds. While talking to him before making my examination, he excused himself to have a bowel movement. After seeing this stool and waiting nearly thirty minutes before ventilation made his bed room again habitable, the diagnosis was made. He had taken three cc. of a liver extract parenterally once a week since the diagnosis of pernicious anaemia a few months before. At this time his blood studies showed hemoglobin 108 per cent, reds 5.2 million, color index 1.

His weight was estimated at about 100 pounds. A diagnosis of sprue was made and a diet of buttermilk, steak, and bananas was prescribed. The liver extract was given daily and calcium with viosterol and dilute hydrochloric acid were added. His response was almost dramatic. From a bed-ridden and hopeless person he was soon able to sit up and two months later he drove sixty miles to report his progress. He has been under observation since then and has been actively engaged in his practice for over two years. He is occasionally careless about his diet and also neglects his maintenance ration of liver extract, but he has learned a good deal about sprue and takes fairly good care of himself. His weight now averages 140 pounds.

I have made a diagnosis of sprue eight times in seventeen years. These two cases are re-

ported in some detail for they illustrate the severity of a well established case in relapse. The first case is of primary interest because of an apparent cure of seventeen years duration by diet alone. The other continues to suffer mild relapses occasionally. Both have been observed long enough to prove the diagnosis and both are enjoying apparently good health and are actively at work at this time.

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Tick Paralysis in South Carolina*

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The tick implicated in the transmission of tick paralysis in North America is the Dermacentor Andersoni Stiles. Recently, however, other species, such as the Dermacentor Variabilis, also have been incriminated as a causative factor in this disease. Both of these species are know as the wood tick, but the former is more prevalent in North West America. Moreover, both of these ticks are frequently found in many of the Southern States. The Dermacentor Andersoni Stiles is the means of transmission or causative agent of tick paralysis, tularemia, and Rocky Mountain spotted fever. Tularemia is not uncommon in South Carolina, but to date there has been little mention of tick paralysis; therefore, it may be worthwhile to report a case of tick paralysis caused by the Dermacentor Variabilis which was treated in the Pediatric Department of Roper Hospital.

At this point it may be of interest to summarize briefly the life history of the Dermacentor Andersoni Stiles as given by Allen Mail and J. D. Greyson: "This tick appears as an adult early in the spring and attaches itself to the skin of large wild and domestic animals and man. The sexes mate when on the host animal, and the female after feeding for about seven days (sometimes more or less) and having increased many times in weight drops to the ground and lays about 4,000 eggs. After about thirty-six days the eggs hatch into minute six-legged larvae or seed ticks. The small larvae ticks crawl upon grass or other low vegetation, and when the opportunity offers, brush off on small animals, such as

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rabbits, squirrels, field mice, and other rodents. They remain on the host for about four days, during which time they engorge, then drop off to the ground, molt, and after about thirty-eight days emerge as eight-legged, middle-size ticks, or nymphs, which are still sexually immature.

"The nymphs attach themselves to the same kind of animals that the larvae ticks fed on. After about seven days they drop to the ground, molt, and in about ninety days emerge as adult ticks. The whole cycle may occupy two years or more."

This adult tick readily attaches itself to children and adults and begins feeding and engorging. The period may be as short as two or as long as six days before there is any evidence that the host is going to develop tick paralysis. Children are much more prone to be attached than adults.

Some research workers have claimed that it is possible to produce tick paralysis by attachment of the female tick to experimental animals. The time that elapses between the bite of the tick and the onset of paralysis is somewhat dependent on the size of the animal and the rapidity of the engorgement of the tick, and varies from six to thirteen days. Such experiments on the human subject at the present time are unwise, for it might result in a fatal outcome.

SYMPTOMS: The patient, who is apparently well one day, may on the next complain of some tingling and numbness in the legs and feet. Shortly thereafter, the patient experiences difficulty in walking, and his gait is of a staggering nature. A little later, he is unable to stand. In more severe cases, the hands and arms are affected, and even the muscles about the throat and tongue may be involved. At times, the respiratory muscles are affected and the patient may die of respiratory paralysis. The constitutional symptoms are of a mild nature. There are few complaints from the patient. The temperature is usually of a low grade type: 99°-101° F., pulse slightly elevated, and reflexes hypoactive or absent. The laboratory findings may or may not be of any importance.

Since this disease is quite rare east of the Rocky Mountains, we are reporting a case that was treated in the Pediatric Department of Roper Hospital.

No. 17657, E. M. F., a four year old white female, was admitted to the Pediatric Department of Roper Hospital June 12, 1941. The history obtained was that this child became sick the morning prior to her admission, that she complained of weakness and general malaise, that she experienced difficulty on arising, and that her gait was of a staggering nature. However, these complaints ceased after about an hour, and the child played the rest of the day. On the morning of admission, the patient complained of headache and weakness in her lower extremities when she made an attempt to walk. On getting out of bed, she was unable to stand and fell to the floor. The patient was seen by a private physician, who referred her to Roper Hospital with a working diagnosis of poliomyelitis.

P. H. Pertussis in Feb., 1941. No other previous illness.

F. H. Mother and father living and well. One sister six years old, living and well.

PHYSICAL EXAM.: T. 99.8 P. 124 R. 28 B. P. 100/40. Poorly developed and nourished four year old white child whose physical development and oral hygiene suggest that there has been inadequate or unbalanced diet for some time. Eyes, ears, nose, and throat normal. Teeth carious with some oral sepsis. No stiff neck. Chest well-expanded with normal muscular reflexes. No rales heard. Heart not enlarged, rate rapid, rhythm regular, no murmurs heard. Abdomen soft and non-tender. Liver palpable. Spleen not felt. All abdominal reflexes present. The patient moved all extremities with good coordination of muscle. Patella reflexes were hypoactive, being more so on the left. Ankle jerk absent bilaterally. The child arose from a lying position without difficulty. Muscles of lower extremities collapsed to some extent when child jumped from a low table to the floor. She walked without difficulty, but had a staggering gait with over-extension about the knees. No abnormal reflexes present. Extreme flexion of sitting posture caused a certain amount of pain.

Laboratory findings:

Urinalysis: Completely negative.

Blood:

R. B. C.	Hgb.	W. B. C.	Polys.	Lymphs.
4,000,000	11 gms.	11,000	64%	36%
4,400,000	13 gms.	5,000	52%	48%

6-16-41 Kolmer and Kline both negative

6-17-41 Urea Nitrogen 15 mg%
Sugar 97 mg%
Chlorides 457 mg%
Calcium 10.3 mg%
Inorganic Phosphorous 5.1 mg%
Total Serum Proteins 6.99 gms
Serum Albumin 4.26 gms
Serum Globulin 2.73 gms

6-16-41 Macroscopic agglutinations for Typhoid, Paratyphoid A & B, Proteus X 19 and Brucella, all negative

Feces: Negative

6-12-41 Spinal fluid:
Total cell count 0
Total proteins 55 mg%
Sugar 45 mg%
Chlorides 740 mg%
Colloidal gold negative
Wasserman negative
Culture negative

Course: The child was put to bed, and her condition remained about the same until the second day. At this time, a nurse while combing the patient's hair discovered a partially engorged tick, which she removed. The tick was identified at the National Institute of Health as a female, Dermacentor Variabilis. Further search did not reveal any other ticks.

The child's symptoms cleared up quite rapidly, and on discharge twelve days following the removal of the tick, there was no muscular weakness present, but still a very slight ataxia. The patient was seen two weeks later in the Pediatric Clinic and appeared completely recovered.

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Recognition and Treatment of Common Painful Back Disorders

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While severe back pain is essentially an orthopedic problem, it is also one which is continually cropping up to puzzle the family physician and internist. Innumerable causes for back pain exist but the commonest causes for pain of such severity and persistence as to require consultation are the following: (1) hypertrophic spondylitis, (2) osteoporosis, and (3) rupture of an intervertebral disk.

Hypertrophic Spondylitis

Hypertrophic spondylitis is extremely common in overnourished patients of fifty years and beyond. The lower cervical and lumbar portions of the spine are chiefly involved in the process which appears to be a response to mechanical factors rather than to toxins from focal infections. The intervertebral disks gradually lose their elasticity as middle life approaches, thus depriving the spine of an important shock-absorbing mechanism. More and more weight is borne directly upon the bodies of the vertebrae and the spaces between them are lessened. Abnormal mobility results which accelerates the grinding down of the articular cartilages at the rim of the bodies and the heaping up of interlocking osteophytes. Simultaneously calcification of the tendons at their points of attachment occurs. The most marked changes occur in the lumbar spine where weight bearing is most prominent and motion least restricted.

Involvement of the cervical spine produces vague pain in the spine itself, often accentuated by exposure and by protracted tension in the neck from uncomfortable position. Not infrequently pain radiates to the shoulders and down the arms. Spondylitis of the upper dorsal spine may produce pain simulating angina and is the usual etiological factor in "intercostal neuritis" in persons of this age group. Lower dorsal spondylitis may send radiations to the upper abdomen mimicking the pain of gall bladder disease, while the same condition in the lumbar spine is responsible for a large proportion of the attacks of ordinary "lumbago" and for many of the gradually developing cases of "sciatica." The symptoms of hypertrophic spondylitis are usually moderate, more annoying than disabling, and never interfere with good health.

Objective evidence of the presence of hypertrophic changes in the spine lies in demonstration of impaired motility in the spine and of characteristic changes in the X-ray picture. It should be remembered that rotation is chiefly a function of the thoracic spine, flexion and extension of the lumbar spine. When these movements are restricted, it is well to back up this observation with an X-ray which, in the typical case, will show increased calcification of the bodies of the vertebrae, narrowed but not obliterated joint spaces, interlocking and occasionally fused osteophytes and no calcification of the anterior ligament. The patient should be observed carefully as he gets up out of a chair; if he first shifts forward to the edge, then bearing heavily on the arms of the chair lifts himself upward with his shoulders and upper arm muscles, and finally propels himself forward and upward with a sudden shove on the arms of the chair, it is quite evident that his is unconsciously trying to protect his back.

The treatment of hypertrophic spondylitis is neither simple nor brilliant in its results. The majority of patients need sharp reduction in weight; a balanced diet of from 900 to 1200 calories daily will do this. They need to be warned against laborious work which adds to the wear and tear on inelastic cartilages but prolonged and complete inactivity is not advisable. A hard bed is more conducive to comfort than one equipped with a soft, springy mattress. Eradication of foci of infection is a disappointing and scientifically unsound procedure as the bony changes in this disease represent response to mechanical factors rather than to bacterial toxins. Physiotherapy can be extremely helpful—short wave diathermy given frequently and for relatively long periods, thirty to forty-five minutes at each visit, has proven helpful during the acute exacerbations of discomfort which mark the course of this disease but it is doubtful if permanent improvement is afforded by such treatment. X-ray therapy on the other hand seems to induce marked amelioration of symptoms in many patients and this improvement is more or less permanent. I am very deeply impressed by the results which our roentgenologist, Dr. P. D. Hay, has obtained in several of these cases I referred to him. One elderly woman has been almost completely relieved of a persistent right upper quadrant pain suggesting gall bladder disease and another, after treatment of the mid-thoracic spine, has been freed from the pain, the dread, and the restrictions which go with the diagnosis of angina pectoris. X-ray therapy is the most promising thing on the horizon at present, but the other procedures mentioned above must not be neglected. Medicine has not been helpful—iodides and salicylates have been prescribed in abundance but to no avail.

Osteoporosis

While hypertrophic spondylitis is encountered usually in overnourished, robust men, osteoporosis is found principally in elderly and rather frail women. This condition is relatively common, four cases having been observed on the medical service of The McLeod Infirmary during the past summer. Until recently, however, it has frequently gone unrecognized as a cause of severe back pain. Osteoporosis is characterized pathologically by extreme decalcification of the bone. Apparently this does not result from inadequate calcium deposition in the osseous matrix as in rickets, but from failure of the osteoblasts to lay down sufficient osteoid tissue. In other words, it is not a disease of calcium metabolism, from which it

follows that providing adequate amounts of calcium supplemented by vitamin D cannot be expected to replenish this mineral in the fragile osteoporotic bones. There is very strong evidence[1] that the post-menopausal state is the most common etiological factor in the development of osteoporosis. The spine and pelvis are sites of predilection while the skull is rarely involved[2].

The commonest symptom is that due to a vertebral lesion. The patient, usually a woman about 60, who may have had annoying weakness and pains indefinitely localized in the back for two or three years, suffers a slight jar such as sitting down too hard or going over a bump in an automobile. She experiences a sudden snap accompanied by an acute pain in the back. The pain is very severe and may confine her to bed for a good many days since she quickly finds that recumbency affords relief while any activity results in excruciating exacerbation of her symptoms. Quite often the pain is projected along nerve roots to the front of the thorax, the abdomen or down the legs. One of my patients had been treated a year for cholecystitis, another for ureteral colic.

The diagnosis is made by X-ray which, if it does not show an actual collapse and buckling of a vertebra, will usually reveal expanded intervertebral disks encroaching on the faintly outlined vertebral bodies. The X-rays of one of my patients showed a denser deposit of calcium in the plaques of the adjacent abdominal aorta than in the bodies of the vertebrae.

Treatment of osteoporotic painful backs aims to relieve pain by correcting any existing deformity, prevent the development of additional deformities, and supply the deficiency of calcium and phosphorus in the bone. Pain is relieved best by mild sedatives and heat and some support for the back. Until I can get the patient fitted with a Taylor brace, I prefer to have her lie flat in bed with slight extension of the spine provided by a firm pad opposite the site of the collapsed vertebra. With a Taylor brace applied, there is no reason for denying the patient a reasonable amount of activity at once. As for supplying the deficiencies in calcium and phosphorus, I rountinely prescribe a capsule of dicalcium phosphate with viosterol four times a day. I have never been able to demonstrate any recalcification of the affected vertebrae but there is good reason to believe that this readily available supply of the two mineral substances at least retards the process of bone resorption. Recent work pointing to the possible relationship between the menopause and the development of osteoporosis suggests the desirability of administering some estrogenic substance regularly.

The results of treatment, certainly as far as relief of pain and freedom for moderate activity are concerned, are most gratifying. On the other hand, when the regimen is stopped, the symptoms frequently recur. The sudden appearance of severe and intractable back pain in elderly women, aggravated by any motion of the spine, is sufficient reason to suspect osteoporosis with pathological fracture of a vertebra.

Ruptured Intervertebral Disk

No less spectacular than the collapse of a vertebra due to osteoporosis and much more commonly encountered is rupture of an intervertebral disk. A very brief consideration of the anatomy of the intervertebral disk will serve to clarify many of the features of the clinical picture resulting from derangements of these structures. Since the disks between the 4th and 5th lumbar vertebrae and between the 5th lumbar and sacrum are involved in fully 96% of all instances of this trouble[3 4 5] for all practical purposes, the rest of the spine may be disregarded. Each disk is composed of three parts: (a) the annulus fibrosus, a thick fibrous retaining ring forming the periphery of the disk, thickened anteriorly where it blends with the strong anterior longitudinal ligament and very feebly re-enforced posteriorly by the thin posterior longitudinal ligament which separates the disk from the neural canal; (b) the nucleus pulposus which occupies the center of the disk, a soft, semi-fluid mass normally under considerable tension; (c) the cartilaginous plates which serve as the superior and inferior surfaces of the disks, separating the annulus and nucleus from the adjacent vertebrae. The spinal cord ends opposite the intervertebral disk below the first lumbar vertebra, hence

any neurological disturbance produced by lesions of the 4th and 5th disks comes not from compression on the cord but from pressure on the nerve roots forming the cauda equina which are firmly fixed by sheaths of the dura mater as they approach their points of exit at the intervertebral foramina. The sequence of events leading to the development of the picture of ruptured nucleus pulposus is about as follows: Some injury such as a fall or a severe strain when the lumbar spine is flexed results in a tear in the annulus fibrosus. Since the annulus is liberally supplied with sensory nerves this injury results in a good deal of pain located in the lower back. At this time there is no radiation of pain. With good luck and sufficient patience the injury to the annulus and overlying posterior longitudinal ligament undergoes repair so that pain and muscle spasm subside, and the nuclear material is retained in its usual place although now held in by a definitely weakened fibrous ring. Then comes a second injury, especially apt to occur in individuals engaged in activities that place strain on the intervertebral disk by stooping or lifting from a bent-forward position. Again the pain appears as the annulus is lacerated but this time not only does it appear in the back at the site of the injury but almost immediately agonizing pain comes down the back of one leg in the typical fashion of sciatica. This is due to the fact that a portion of the semi-solid nucleus pulposus has finally been extruded through the tear in its restraining ligament and, pushing back into the lumen of the neural canal of the spine, has impinged on either the 5th lumbar or 1st sacral nerve roots causing painful tension on them.

In the light of the foregoing anatomical and pathological data, the history of many cases of low back pain with sciatica may be so characteristic as to indicate not only the probable diagnosis but also the exact level of the lesion. A very few minutes of painstaking questioning will bring out evidence for a reasonably positive diagnosis. The syndrome of disk injury with impingement on the sciatic roots is now so well established that it can be made by any up to date physician.

Dandy[3] says that the diagnosis of ruptured vertebral disk in the fourth and fifth lumbar interspaces can be boiled down to a history of "low midline lumbar backache plus pain down the back of one or both legs, the pain is intensified by coughing and sneezing, and the pain must be recurring and not continuous." That succinct statement presents the syndrome in its simplest terms. The initial symptom of the disorder is almost always pain low in the back, commonly recalled by the patient as an attack of "lumbago." This "lumbago" is due to trauma to the intervertebral disk and to the posterior longitudinal ligament; it is relieved by immobility and intensified by movements affecting the spine. Repeated attacks of "lumbago" often precede the onset of sciatic pain, many originating from spinal injuries so trivial as to escape notice. "Sciatica" appears soon after one of these attacks of backache, sometimes they appear together as in cases where severe injury not only ruptures the annulus but simultaneously causes protrusion of the nucleus. Along with the agonizing pain down the back of the hip, thigh and calf, so familiar to us all, the sufferer from sciatica may complain of intense burning sensations and other unpleasant parasthesias in the foot or on the lateral aspect of the lower leg. The intensification of pain by coughing and sneezing are points which should be brought out in questioning; such evidence is almost pathognomonic of a disk lesion. Love and Walsh[4] regard the intensification of the pain which occurs during sleep as similarly suggestive of a disk lesion.

There are comparatively few signs in connection with the condition but they are dramatic and unmistakeable. In the first place there is the general attitude of the patient characterized by stiffness and immobility of the lumbar spine which is usually held slightly flexed and "off center" from tilting of the pelvis to favor the painful leg. A positive Lasegue sign is present in from 85 to 100% of disk cases—this test is familiar to many: With the patient supine, the thigh is raised until it forms a right angle with the trunk and then the leg, which has remained flexed, is extended until pain begins along the course of the sciatic nerve; at this point the foot is then

dorsiflexed to determine whether additional pull on the sciatic nerve intensifies the pain. Tenderness along the course of the sciatic nerve is another sign of frequent occurrence and almost as often the Achilles reflex is diminished or absent on the side of the pain. The demonstration of areas of diminished cutaneous sensation (hypasthesia) or even anesthesia is a less frequent sign of disk protrusion but when present practically erases the last doubt about the diagnosis.

Formerly it was considered imperative to have X-ray confirmation of encroachment on the neural canal following the injection into this space of some contrast medium, either iodized oil or air. But with the clear-cut definition of the clinical picture of the syndrome, the role of X-ray in the diagnosis has assumed a position of very secondary importance. Dandy[3] goes so far as to say: "If the diagnosis is questionable, an exploration of the region is preferable to spinal injections of air or iodized oil." Similarly another diagnostic procedure in this condition, lumbar puncture with determination of the total protein in the spinal fluid, is rapidly being discarded. Spurling and Grantham[6] report that the total protein content of the spinal fluid was elevated in only fifty percent of proved cases of herniation of the nucleus pulposus in their series. So definite is the clinical picture of this common disease of the intervertebral disks that an overwhelming percentage can be diagnosed and localized by the history and physical examination alone and all accessory diagnostic tests can and should be dispensed with.

Given a diagnosis of ruptured disk there is only one sure and relatively permanent cure—surgical removal of the injured and protruding portions of the disk. This is no longer a Herculean task. Refinements in technique for this procedure have reduced the risk to almost negligible figures (0.5%[4]) while at the same time enabling the work to be done without sacrificing the stability and strength of the spine. The question very naturally arises—aren't there some conservative measures which can be adopted, reserving surgical treatment for the time when other procedures have failed? Until the past three years, every one of my patients with this symptom picture was treated conservatively—quite unwittingly to be sure, because in those years the possible connection between injuries of the intervertebral disks and pain in the sciatic nerve was certainly not generally recognized. Among those conservative measures I can recall employing the following: Protracted bed rest, bed rest on a hard bed, bed rest with traction on the legs, diathermy, massage, plaster jacket, adhesive strapping, removal of foci of infection and back in the distant past, injection of saline into the sheath of the sciatic nerve. The diversity of procedures is sufficient evidence of their ineffectiveness. To be sure some of the patients got better; what happened in those cases I do not know—probably the herniated nucleus underwent spontaneous replacement and the torn ligaments healed sufficiently to keep it in place. I see some of these old patients occasionally now for other complaints and without exception they report that their backs are still giving them trouble, although the sciatica has disappeared completely.

Before leaving the subject of conservative treatment, let me mention one other procedure which has been employed by my associate, Dr. R. B. Stith, in several cases where we had made the diagnosis of ruptured disk. It was used in those cases who either refused surgery, who could not afford surgery, or who were suffering so intensely that something had to be done to relieve them while arrangements were being completed to get them operated on. I refer to the injection into the epidural space of physiologic sodium chloride solution. This space is entered at the superior sacral foramen just above the sacrococcygeal articulation with an ordinary lumbar puncture needle. Through this 50 cc. of half percent novocain solution is introduced and then salt solution is injected, usually under considerable pressure, until a total volume of fluid amounting to 80 to 100 cc. has been employed. Intense accentuation of the sciatic pain accompanies the injection but within twenty-four hours there is frequently astonishing relief from pain. If the first injection produces no results, a second and a third may be tried at forty-eight hour intervals. Why this works as well

as it does is somewhat of a puzzle unless the intense pressure exerted by the incoming fluid dislodges the nerve from its position in contact with the herniated portion of the disk. I am not advocating this as a cure for rupture of the disk; it is merely a rather effective stopgap—so effective that afterward it may be hard to persuade the patient that he still needs operation.

On the whole, conservative treatment, with the possible exception I have mentioned, holds out little hope of relief in those cases of suddenly developing low back pain associated with sciatica. Not only is it usually unprofitable but it can be actually harmful. The very first case of this kind which I finally recognized was studied over a period of several weeks so deliberately and so many temporizing and ineffective methods used that by the time she came to surgery, the fifth lumbar nerve had been incorporated inseparably into the nuclear material against which it had impinged and finally had to be sectioned. There is little excuse for failing to recognize the impressive symptoms and clear cut signs of a ruptured intervertebral disk. Let any physician think back over his sciatica patients and he will most certainly find that the majority of them fit into this classification. The important thing to remember is that relief from this agonizing distress is now possible in a manner no less dramatic than its onset.

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Dr. James A. Babbitt, emeritus professor of clinical otolaryngology (diseases of the ear, nose and throat) at the University of Pennsylvania School of Medicine, and associate professor of otolaryngology in the university's graduate school of medicine, Philadelphia, was named president-elect of the American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago, Wednesday night, October 22. Dr. Babbitt will take office January 1, 1943. The present president-elect is Dr. Ralph I. Lloyd, Brooklyn, who will assume office on January 1, 1942.

A novel and unique method of giving *blood transfusions* just behind combat lines was that devised by Dr. W. Dsbanowsky, who describes this method in a Russian medical journal published in the Ukraine, the Radianska Meditzine, No. 7-8, 1940, pages 78-79.

The method described is very simple and, after having transfused several hundred wounded on the battlefield, its application has been highly satisfactory.

A child's ordinary rubber ball is used, having the capacity for at least 500 cc. of fluid. A wire loop is made to fit around the ball in order to control this distension and thus its capacity. The diameter of this loop was previously measured. One or more loops may be used depending upon the amount of blood to be transfused. A flexible rubber hose, two-way cock, and needles are all that is necessary. This material is previously sterilized and stored by wrapping in a sterile towel.

When giving a transfusion, the operator sucks through this apparatus 5 percent sodium citrate several times until all surfaces are well lubricated with the solution, keeping about 50 cc. in the bulb. The bulb is compressed allowing the air to be expelled through one opening of the petcock. The handle of the cock is then turned, preventing the return of air into the ball and permitting the expulsion of air from the tube. The needle is then inserted into the vein, the ball is lowered, and air is permitted to escape from the hose through the cock until the blood is seen, when the cock is turned permitting the blood to enter the bulb both from gravity and from suction produced by the expanding walls of the ball. When the ball has expanded to the capacity permitted by the wire loop, the cock is again turned, the needle is withdrawn, changed, and placed into the recipient. The ball is then elevated and the return of flow can be controlled both from gravity and by compression on the bulb. When all blood has entered the recipient the cock is turned, needle withdrawn, and apparatus cleaned and made ready for another transfusion.

THE JOURNAL
OF THE
South Carolina Medical Association

EDITOR
Julian P. Price ..... Florence, S. C.

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Office of Publication: (In care of the Editor) ..... Florence, S. C.
Subscription Price ..... $3.00 per Year

DECEMBER, 1941

P. A. S. P. D. V.

A new agency has been established, by Presidential order, which will play a vital part in the lives and work of physicians in the near future. The official name of the agency is the Procurement and Assignment Service for Physicians, Dentists, and Veterinarians, and its function will be to receive requests from various governmental and other agencies requiring professional personnel and to fill these needs through appropriate means. The entire program is predicated upon volunteering of service and the leaders of the profession who have been active in promoting the establishment of this agency believe that the physicians, dentists, and veterinanians of the United States will be more than willing to do whatever is asked of them, once they have been shown the need for their services. Should the program fail, however, it is highly probable that some form of compulsory measure will be adopted. The office is now being established and the details of the program are being worked out. Just what the modus operandi will be has not been determined, but it will probably follow some such course as this: The Army, finding a need for ten urologists, will make known its need to the Agency. Through the lists and records now at its disposal, the Agency will select the names or thirty or forty physicians who are qualified to serve and whose removal from their present location will not work untold hardship on their local communities. These men will be contacted regarding their willingness to serve. From the list of those who signify their availability, ten names will be selected and sent to the Army. These men will then be called.

It can readily be seen that the success or failure of this plan will depend upon two things: the ability of the Agency to select physicians in such a way as to fill the need of National Defense without impairing the medical needs of the civilian population, and the willingness of physicians to volunteer services when the occasion demands. The personnel of the Agency (Drs. Frank Lahey, Harold S. Diehl, James E. Paullin, Harvey S. Stone, and C. W. Camalier, Jr.) and the methods adopted to date speak well for the technical part of the program. The big question now is—will physicians, the country over, volunteer their services when the time comes?

The history of medicine in this country shows that physicians have always been ready to volunteer their services in times of emergency—and we believe that the present emergency will be no exception. Show the average physician the place where the need is the greatest and his love of country plus medicine's great tradition of serving others will cause him to proffer his services gladly and immediately. To be sure, there are those whose love of self is so much greater than love for country or for fellowman that they will refuse to budge from their present locations under any circumstances, but their number is not large. The vast majority of physicians are ready to go if the need arises.

Once again, the physicians of this country are on trial. Knowing these physicians for what they are, men who place service to others above selfish interests, we are confident of the stand which they will take. They will be weighed and found not wanting.

THE SULFONAMIDES

Where medical men are gathered together there sulfonamides are discussed and the recent meeting of the Southern Medical Association was no exception to this rule.

From the wealth of material which was presented certain conclusions may be drawn.

1. The sulfonamides are here to stay and are of ever growing importance to the physician in practice.

2. The most popular member of the group at the present time appears to be sulfathiazole although sulfadiazine will probably usurp this position as soon as the cost of the drug has diminished sufficiently to meet the requirements of the average pocket-book.

3. When given, the sulfonamides should be given in adequate dosage. Small doses do not prevent the reactions which occasionally occur and may prove harmful in that the patient does not receive the benefit of the drug when he needs it most.

4. Sulfathiazole and sulfanilamide are absorbed and excreted more rapidly than is sulfadiazine. For this reason the first two drugs should be given at four hour intervals day and night while sulfadiazine may be given every six hours.

5. The initial dose of the drug should be a large one, approximately three times as large as the subsequent regular doses.

6. The sulfonamides are of value externally as well as internally and are beneficial in the form of ointments for superficial infections, in the form of powder crystals for contaminated wounds, and in the form of a spray for treating burns.

7. The sulfonamides, particularly sulfanilamide, are of value in the treating of peritonitis when introduced in crystalline form directly into the peritoneal cavity.

8. Sulfathiazole and sulfaguanidine, particularly the latter, have been found to be almost specific in the treatment of bacillary dysentery.

9. The sulfonamides are of great value in preventing spread of severe upper respiratory infections to the sinuses, the ears and the mastoids.

Human plasma and *serum* are coming to the fore more and more and a brief summary concerning their usage is presented by L. R. Newhouser and D. B. Kendrick, in the United States Naval Medical Bulletin (October, 1941).

"Blood plasma and serum are the therapeutic agents of choice for the emergency treatment of traumatic shock, hemorrhage, burns, and other conditions in which fluid and electrolyte balance are altered.

"Human plasma has been found to be the most satisfactory fluid for the replacement of lost blood volume and the restoration of depleted blood proteins; these findings have made plasma transfusions a procedure of common practice. This does not mean that blood transfusions should be or can be abandoned. On the contrary, there is a definite place in the category for both blood and plasma.

"Plasma does offer certain advantages which are worthy of consideration. It can be used without typing either donor or recipient, may be stored for many months in the liquid, frozen, or dried state and then administered safely. Long distance transportation does not alter its normal constituents. It can be made available for instant use and when injected it does not tend to increase the concentration of red blood cells in cases of shock and burns when hemoconcentration is already present.

"Plasma and serum differ in composition and methods of processing. Plasma is the supernatant fluid which separates from the cellular elements when an anticoagulant is added to blood. Serum is the liquid portion of blood which separates when blood clots. Plasma contains albumin, globulins, and fibrinogen. In serum the fibrinogen has been removed in the process of clotting. The relative merits of plasma and serum have provoked a great deal of controversy but it may be said that when properly prepared both serum and plasma produce results which are quite comparable."

HISTORICAL SIDELIGHTS

A SKETCH OF MEDICINE IN SOUTH CAROLINA 1670-1700

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In the spring of 1670, there arrived at a point of land on the Kiawah River in the sprawling land of Carolina, a party of English and Barbadian colonists, who succeeded in establishing the village of Charles Town, the beginning of the present State of South Carolina. With them came the rudiments of English medical knowledge, and among them were, perhaps, some few persons who had more or less skill in the practice of medicine.

These people came from a country but recently freed of the horrors of the Great Plague, and afflicted to a degree with "intermittent fevers" and other communicable ailments, which must have left some impress on the emigrants. Whatever physical disorders they may have brought along had very likely been aggravated by the hardships of tedious voyages. They were fortunate in that they encountered no new variety of sickness among the natives, but even so, the need for a well-trained physician was obvious but unfilled in a colony far from all other source of medical help.

The competent English physician of the day was possessed of a reasonably broad knowledge, for medicine had accomplished much in the years preceding the settlement of Carolina. Before the turn of the century, anatomy and surgery especially had acquired new momentum. Medicine everywhere was still much under the spell of the dull authority of the ancients, but showed some signs of heeding the spirited exhortations of Paracelsus that physicians abandon Galen, think for themselves, disregard the noisome polypharmacy of the day and turn to the new chemical knowledge. Francis Bacon and Descartes had emphasized the way to scientific study as the times improved and social reforms were instituted. Harvey had patiently produced his revolutionary theory of the circulation of the blood, and Van Helmont had built noble systems on a knowledge of the chemical processes of the body. Malpighi had illuminated a budding histology. Sydenham had arisen as a great clinician and by keen bedside observation, had shed needed light on many confusing diseases. Thomas Willis had opened roads to more reasonable therapy. Obstetrics as practiced by the man-midwife had attained respectability at the very time that the Carolina colonists were landing in America, for Julien Clement delivered Madame de Montespan at the French Court in 1670 and set a fashion which quickly spread to England. The microscope was revealing unsuspected worlds and a new science was sprouting from its lenses. From these new beginnings, valuable speculation was about to develop and flower[1].

The prevalent recognized epidemic diseases in England of the time were many, and the current reputable remedies were relatively few, but definitely drastic. Plague, malaria, dysentery and typhus were familiar visitors. Physicians leaned more to the abundant use of bleeding, purging, and blistering, than to Sydenham's faith in the *vis medicatrix naturae*. Cinchona, ipecac, mercury and antimony were held in high repute, and given in large doses. Many a local Dr. Sangrado reduced his patients to the point of exsanguination. The clyster was a favorite remedy for various ills. Smallpox inoculation was not yet generally known, and preventive medicine was still in large part a vague theory. Despite the contributions of Pare', surgery as practiced by the best men of the time was still crude and dangerous.

The story of medicine and its practitioners of the very earliest days of Charles Town is scanty and unsatisfactory. Men came to the new colony in search of a refuge or a fortune, to trade or to explore, rather than to carry

(Prepared under the direction of the Committee on Historical Medicine of the South Carolina Medical Association.)

on the practice of a profession which they had adopted in another country.

The glowing stories of the virtues of the Carolina climate, as described by the press agents of the Lords Proprietors, were certainly not such as would attract physicians seeking extensive practices. In an account published in London in 1682[2], one of these writers says of the remedies and diseases of the new country:

"The air of so serene and excellent a temper, that the Indian natives prolong their days to the extremity of Old Age—and where the English hitherto have found no Distemper either Epidemical or Mortal, but what have had their Rise from Excess or Origine from Intemperance. In July and August they have sometimes touches of Agues and Fevers, but not violent, of short continuance, and never Fatal. English children there born, are commonly strong and lusty, of sound constitutions, and fresh ruddy complexions."

Speaking of the herbs of the colony, he mentions a "variety of such whose Medicinal Vertues were rare and admirable. The China grows plentifully there, whose Root yields us that pleasant Drink which we know by the Name of China Ale in England: In Medicinal uses it's far more excellent. . . . It mundifies and sweetens the Blood. It's good in Fevers, Scurvy, Gonorrhea, and Lues Venerea. They have three sorts of the Rattle-Snake Root which I have seen: the Comous, or Hairy, the Smooth, the Nodous, or Knotted Root: All of which are lactiferous, or yielding a Milkie Juice. They are Sovereign against the Mortal Bite of that Snake, too frequent in the West Indies. In all Pestilential Distempers, as Plague, Small Pox, and Malignant Fevers it's a Nobel Specifick; when stung, they eat the Root, applying it to the venemous Wound: or they boyl the Roots in Water; which drunk fortifies and corroborates the Heart, exciting strong and generous sweats; by which endangered nature is relieved; and the Poyson carried off and expelled." He describes the Sea-Cow, and affirms that "It hath a stone in the Head which is a gallant Remedy against the Pains and Dolor of the Stone; so are the Bones of its Body to provoke Urine, when pulverized and exhibited in convenient Liquors."

Another enthusiastic writer[3] says that "Such, who in this Country have seated themselves near great marshes are subject to Agues . . . etc; divers Persons who went out of England Ptisical and consumptive, have recovered, and others, subject in England to frequent fits of Stone, have been absolutely freed from them after they have been there a short time; nor is the Gout there, yet known. The air gives a strong appetite and quick digestion; nor is it without suitable effects; men finding themselves apparently more lightsome more prone, and more able to all youthful Exercises than in England; the Women are very fruitful and the children have fresh sanguine complexions." Even the present day exponent of California or Florida could promise no more.

Stephen Bull, an early settler, wrote in 1670[4]—"wee conceive this to be as healthfull A place as ever was settled wee have lost but fower p'sons since wee satt down heere, & those was sickly p'sons & in A declininge condicon of health before wee landed there is some p'sons that have had feaver and Ague butt we observe little mortality in the distemper neither is the distemper neere soe high as is usuall in other Places . . . May itt please yor Honor our govrnor is ill of the feavr & Ague & being aged & falen into A relapse I doe much feare his recover." Another correspondent[5] wrote that the colony lacked nothing except "cattle, company, and good liquor." Thus disease was of minor concern to colonists who were in constant acute fear of a Spanish invasion, though shortly after this time Governor West wrote[6] "Here is wanting amongst us a good Doctor, and a chest of good medicines, those few people yt have dyed amongst us, I believe most part for want of good lookeing after, & that wch is fitt for men: Wee have not (thankes be to God) had one dyed out of our ffamily since wee came ashore which I looke upon as a very great ffavour from God: Ou Servants have bene sickly as well as others but now they are indifferently healthfull, and I hope season'd to the Country . . . wee find that one of our Servts we brought out of England is worth 2 of ye barbadians,

for they are soe much addicted to Rum, yt they will doe little but whilst the bottle is at their nose."

In 1672 the settlement at Charles Town had grown from its original handful to about 500 people. By 1680, it had grown to about 1200, as the Huguenots and Barbadians began to arrive, and by 1682, it included nearly 4000 souls. In 1684, there appeared the first notable general sickness, an epidemic of a disease which was probably malaria arising from cases imported among the settlers. Discouraged by this event, and ignorant of its cause, the Proprietors wrote[7] in June, 1684 "We are by all people informed yt Charles towne is no healthy scituation and yt it hath no good Water in it and all people that come to the province and landing there & the most falling sick it brings a Disreputation upon the whole Country wherefore wee desire that you will cause some other place to bee Searched out upon Cooper River nere the T to build a port towne on for that River & let it be Reserved for that Use until you have informed us of it & Received our opinion thereon." and later the settlers arriving from Scotland in October reported[8] "We found the place so extrordinerie sicklie that sickness quickly seased many of our number and took away great many of our number and discoraged others, insomuch that they deserted us when we wer to come to this place (Port Royal) and sold of their servants .... We came here the beginning of November, sicklie as we wer, we most confess the countrie is verie pleasant and desirable and promiseth well enough, better by far than any other place in Carolina that we had occasione to see. We setled ourselves altogether in a verie convenient place for a toun being about twentie miles from the mouth of the river Port Royall . . free of swamps and marshes, a high bloffe land excellently weell watered, of such wholesome air as many of us quickly recovered, and none have contracted sickness since we came tho many died of the sickness they contracted at Charlestoun at our first arravell."

Shortly afterward, a ship from Londonderry touched at Port Royal and lost twenty-nine persons because of sickness contracted there[9]. Some years later, a dismal account of the Carolina country said that "Two young men have just arrived from Carolina, who give some news of the country. In the first place, they say that they have never seen so miserable a country nor an air so unhealthful. They have fevers all year long from which those attacked seldom recover; that, if some escape, they become all tawny as are these two who have arrived, who are pitiable to behold. Moreover, the heat there is so intense that it is almost unbearable, and this infects the water, and in consequence diseases are caused, there being no other drink there. They also bring tidings that, before their departure, a vessel came from London with 130 persons, including the crew, of whom 115 are dead, all from malignant fevers which spred among them."

In the face of these unfortunate developments, immigration declined and progress of the colony was much retarded. We may believe that such physicians as were at Charles Town were in great demand, and that their efforts may have been successful in saving many who otherwise might have succumbed to the deadly infection. There is nothing to show that these physicians used cinchona; although it was at that time a long established remedy for malaria, it may well have been unavailable to these provincial doctors.

Of the medical activities of the earliest physicians of Carolina, very little is known. Henry Woodward was the most distinguished by virtue of an adventurous career. Coming out with the early expedition to Port Royall in 1666, he was left as a guest among the Indians and established himself with them so securely that his influence was extremely valuable when later difficulties arose. Afterwards captured by the Spaniards and taken to St. Augustine, he escaped when Searle the buccaneer assaulted that town, and thereafter shipped as surgeon aboard a privateer. Having been shipwrecked on Nevis, he joined the first colonists when they touched there on their way to Carolina, and settled with them at Charles Town. Later he was accused of helping the Westo Indians to war against the settlers, and went to England, where he was fully acquitted of the charge. He was immensely valuable to the colony in dealing with the

natives, and was a man of recognized importance in all local affairs. We may assume that he exercised his surgical art upon both settlers and natives, but no record supports such assumption.

Of other medical men, little remains except a few names and dates. Dr. Will Scrivener, deputy for Lord Berkeley, was active in local politics and died in 1671. "Doctor Tho: Smyth," the Landgrave, is mentioned as an early arrival[11] and he made a will bequeathing "all my instruments that belong to Chirugery and one half of all my medicines—alsoe my large brass mortar and pestle"[12] to his son George Smith, who is said to have taken a medical degree at Edinburgh in 1700 at the age of 28 years. George Smith afterward lived for many years at Goose Creek and is also said to be the first permanent resident of Carolina to obtain a degree from a college.

Dr. William Clarke[13] and Dr. Peter Bodett[14] arrived before 1678. Clarke styled himself "Chrurgeon" in his will, and was possibly the first real practitioner in Charles Town. Bodett lived on Goose Creek. Joseph Blake, a surgeon, probably was not very active in his profession, but devoted himself to political and economic matters, as did his friend James Williams, another surgeon who settled in Colleton County about 1683. In Berkeley County, Dr. Charles Burnham[15], a New England Quaker, was prominent in politics, if not in medicine. Dr. John Hardy was a man of large holdings, having three thousand acres in a grant . . . ." In the troublous administration of James Colleton, 1686-1690, Hardy became involved in disputes with the Governor, and, when the latter proclaimed martial law in 1689, the doctor decided to quit the country. According to a partisan of Colleton's, Hardy left pending a suit against the latter for £150 'For Phisick and as a phisitian and for some small merchandise.'" The Governor brought a counter suit, and, "It was proven by concuring proofs that the Gov and his lady gave him (Hardy) 10 lib in gold as a reward for his atendance as physitian. . . it ended in Hardye's being 7 pund in the Gov Debt."[16] Although Colleton's arbitrary rule was quickly brought to an end, Dr. Hardy probably did not return to South Carolina. In the power of attorney, which he executed before leaving, he is described as a "physitian," and he was probably a doctor of medicine.

Of Doctor William Trevellian[17], little is known beyond the fact that he was in the Province during the sickness of 1684. The two Smiths, Woodward, Clark, Bodett, Blake, Williams, Burnham, Hardy and Travellian, ten in all, were the only medical men who are known to have been on hand during the epidemic. By that time, the colony probably contained in the neighborhood of six thousand inhabitants, exclusive of the Indians living in the settlements. Hence, even if there were ten or a dozen practitioners besides those whose presence is recorded (which is unlikely) few people could have enjoyed the personal attention of a doctor. The majority, particularly in the country, must have depended on home remedies and the dubious help of neighbors with local reputation for some knowledge of physic. This condition was common enough in Europe at that time, and indeed is not unknown in many parts of our own country at the present day.

While systematic medical activity before 1700 is not evident, there is some sign of a developing local interest in health and disease in the form of various acts passed for the benefit of the sick and unfortunate. In 1695, an act for registering birth, deaths, and marriages was passed. In 1696, the Vestry of St. Philip's Parish was authorized to raise funds for the care of the sick. In 1698, it was ordered "yt Mr Jonathan Amory Receiver Do Pay Doctr Georg ffrankline out of ye Publick Money Twenty fower Dollas in full for medicines and attendance on a Poore wounded Seaman." He was also ordered to pay Mrs. Williams and Mr. Burroughs "the Sume of Eighteene Dollars for six-weekes Dyett and Nursing a Poore Miserable wounded man—again 30 dollars for 8 weeks diet and nursing "as allsoe for ye Burriall of a Poore wounded Seaman."[18] Franklin was an apothecary who arrived in 1686 and later returned to England. Some of the specimens of Carolina products which he sent home eventually became a part of the British Museum.

After the epidemic of 1684, the colonists remained free of serious disease until a catastrophic wave of yellow fever appeared in 1699. McCrady[19] says "a malignant disease, with little doubt yellow fever, was brought in from the West Indies and raged in the town. In a letter from the Governor and Council, dated Charles Town in South Carolina, January 17, 1699-1700, they state that they had nothing to communicate but that a most infectious pestilential and mortal distemper (the same which hath always been in one or more of his Majestys American plantations for eight or nine years last part) which from Barbados or Providence was brought in among us into Charles Town about the 28th or 29th of Aug. last past, and the decay of trade and mutations of your Lordships public officers occasioned thereby. This distemper from the time of its beginning aforesaid to the first day of November killed in Charles Town at least 160 persons. . . . Besides those have died in Charles Town 10 or 11 have died in the country, all of which got the distemper and were infected in Charles Town went home to their families and died; and what is notable not one of their families was infected by them."

Another letter states that "150 persons had died in Charles Town in a few days;" that "the survivors fled into the country" and "that the town was thinned to a very few people."

It is noticeable that Chief Justice Bohun, the Rev. Samuel Marshall, the Receiver General Ely, and Edward Rawlins, all newly arrived, fell victims to the disease. But the old settlers were not exempt. Half of the members of the Assembly died. Nicholas Trott, the Attorney General, though a new arrival, escaped. Dr. Ramsay, who wrote many years later in 1809, observes 'this disease was generally called the plague by the inhabitants, but that from tradition and the circumstances, particularly the contemporaneous existence of the yellow fever in Philadelphia, there is reason to believe that the malady was the yellow fever, and if so, it was the first appearance of that disorder in Charles Town and took place in the nineteenth or twentieth year after it began to be built. He considers that its reappearance in 1703 makes it still more probable that it was the yellow fever.' Here was a disease unfamiliar to Europeans and full of danger in that no one knew how it spread or how to treat it."

Occasional mention of names and activities indicates that a reasonably large number of physicians were in the province before 1700. Dr. Isaac Porcher, Huguenot refugee, came to Carolina in 1696 and lived at the Santee settlement, later on Goose Creek and Wassamassaw. He became a prominent citizen. John (Jean) Thomas, a Huguenot, appears in the Journal of the Grand Council for 1692—in connection with what may be the first autopsy in Carolina—"Petition of John Thomas, Chyrugen, against Mr Jonathan Amory and Mr. George Dearsley admirs of Mr. Wilson Dunston Deced for five pounds for opening the said Dunston after the disease (It was ordered that Amory and Dearsley) pay the said John Thomas fifty shillings for inspecting the said Dunston's wound after his death as alsoe for this visitt and advice in his Life time." One of Dr. Thomas' patients wrote of him as "the only Pson that deserves the Name of a Phisician in this place" (Charles Town), but later the same patient, disappointed in his hope of improvement, wrote that the best of the doctors in the town had "originally been no more than Barbers."[20]

Antoine Cordes of Berkeley County, like his compatriot Isaac Porcher, was said to be a doctor of the University of Paris; both signed documents describing them as surgeons. These two, and Joseph Marboeuf de la Bruce, an apothecary, settled eventually in Craven county. Daniel Brabant was another Huguenot surgeon, but of his surgical doings there is no record.

William Sallmon "Doctor of Physicke" bought land of Landgrave Smith (1684-5). James Williams lived on the Wadmalaw. Nathaniel Snow, Chirurgeon, who lived at Goose Creek, witnessed a will in 1700 and for his efforts with the patient was to be paid his "charges for burying of him, his medicines truble dyett skill and time."[21] Dr. Atkin Williamson is mentioned in a will dated 1697; Dr. Thomas Tode is similarly noted in 1697.

In 1692, Richard Newton, "a privateer shipp's surgeon having given parole, escaped from Charlestown but was driven back." Thomas Napper, Chyurgeon of Johns Island in Carolina, is heard of in 1685. Dr. Jacob Burdell helped to appraise an estate in 1694. Dr. Henry Bolt appeared in a document of 1699. Robert Adams, "Physition," had his will proved in 1697. Dr. William Harris survives only as a name. No doubt many others are buried in obscurity; certainly little survives of their medical exploits.

Thus for its first thirty years, the struggling Carolina colony can scarcely be shown to have contributed much to the development of medicine in America. Such pioneer medical men as were in and about Charles Town before 1700 were probably occupied with many things beside the practice of medicine, and no account of any contributions by them either to the art or to the science of their profession has been unearthed. As the settlements became more stabilized, more prosperous, and more populous, the eighteenth century brought in a setting for the brilliant group of physicians who were to bring to Carolina a national and even an international reputation for medical excellence. Lining, Chalmers, Garden, Dale, the Moultries, Killpatrick, and others, were to flourish soon in a colony which was fast reaching an important place in the development of America.

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13. S. C. Court of Ordinary 1672-1692—214.

14. Warrants for Lands 1-167 Columbia 1910-15 S. C. Court of Ordinary (1672-1692) 6, 61-62.

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17. S. C. Hist. & Gen. Mag. 32-23.

18. Warrants II-145.

19. McCrady, Edw., South Carolina Under the Proprietary Gov. (New York 1897) 308-310.

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A romantic account of Henry Woodward's career is to be found in "Hilton Head" by Josephine Pinckney—Farrar & Rhinehart, New York—1941.

The author has derived much assistance in preparing this paper from St. Julien Child's—Malaria and Colonization in the Carolina Low Country 1526-1696—Baltimore—The John's Hopkins Press 1940.

It is thought by many that *sulfadiazine* will soon become the most widely used of the sulfonamide drugs. The present status of our knowledge concerning this drug is well summarized by William J. Doyle in the September, 1941 issue of the Rhode Island Medical Journal.

"1. Sulfadiazine has proved less toxic than the other sulfonamides in animal experiments and is at least as effective in experimental infections.

2. Sulfadiazine is readily absorbed from the gastrointestinal tract in man and high blood levels are easily obtained.

3. The excretion of this drug is slower than that of the others and conjugation occurs to a lesser extent.

4. Sulfadiazine penetrates into the spinal fluid and other body fluids in effective concentrations.

5. The common toxic symptoms occurring with other sulfonamides have also occurred with sulfadiazine but are noticeably less frequent and less severe.

6. Clinical use in nearly 500 cases has shown it to be remarkably effective in pneumococcic, streptococcic, staphylococcic, and meningococcic infections. It also gives promise of being useful in other conditions.

Sulfadiazine is, then, another important step toward the production of chemotherapeutic agents that will fulfill Ehrlich's ideal."

PRACTITIONER'S PAGE

This page is devoted to the everyday problems of the physician in practice. Members of the Association are urged to suggest subjects for articles which they desire discussed. Members are also urged to submit questions. Each question will be referred to some physician who is qualified to make answer, and if the question involves a subject of general interest, the answer will be printed.

VITAMIN A

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Although true vitamin A as found in fish liver oils is colorless, an orange-yellow substance found in green and yellow vegetables, and know as carotin, can be converted into vitamin A in the body. We usually associate carotin with carrots and other yellow vegetables such as sweet potatoes and yellow squash, but as a matter of fact a good many green leaves contain more carotin than carrots. In work with animals it was observed that deprivation of vitamin A caused cessation of growth and later inflammation and ulceration of the conjunctiva and cornea, i. e. xerophthalmia. This condition has been seen in children. More recent is the discovery that an early manifestation of deficiency in man is impaired sensitivity to dim light, due to deficiency in rhodopsin or visual purple. However, sub-normal dark adaptation can be caused by factors other than vitamin A deficiency, as for example by lack of oxygen.

Instruments for measuring ability to respond to changes in light intensity have been devised and are being used. Another possible test for adequacy of vitamin A nutrition is the measurement of the vitamin A and carotin content of blood plasma. Low values point to inadequate supply. Infection causes a prompt and considerable fall in both plasma carotin and vitamin A, but after the temperature returns to normal these values increase again and there may even be a temporary excess. Serum vitamin A is low in chronic malignancies, in tuberculosis, and in Graves' Disease. It is not affected in colloid goiter, and tends to be high in lipemia including the lipemia of diabetes.

The rather prevalent belief that vitamin A protects against infections seems to be based on the observation that prolonged deficiency causes atrophy and keratinization of the epithelial tissues which line the cavities of the body, and hence lowered resistance to the entrance of micro-organisms. Experiments on feeding cod liver oil to persons on uncontrolled diets have not shown marked increase in resistance to the common cold, and it is improbable that better resistance to such infections can be expected through administration of vitamin A unless there has been tissue injury due to its lack.

The mechanism of the conversion of carotin to vitamin A in the body is not understood, but since in liver damage vitamin A improves dark adaptation where it was previously deficient, but carotin does not, it seems probable that this change takes place in the liver. Hence it is quite possible that cases will be found which will respond to fish liver oils but not to carotin.

The daily standard allowance for adequate nutrition has been set at 5,000 USP units for adults, increased to 6,000 in pregnancy and 8,000 in lactation. For children 1500 units is recommended for the first year of life, increasing to 5,000 at age thirteen. Thin leaved green plants which are used as food are abundantly supplied with carotin. Egg yolk and liver are excellent sources, containing both vitamin A and carotin. Stimulated by the lack of Norwegian cod liver oil, research has found that liver oils from other varieties of fish are as high, and some of them higher in vitamin A potency, than cod liver oil.

For normal nutrition, there seem to be a goodly variety of food sources without recourse to medicinal preparations. For therapeutic use, liver oils of halibut, ling, mackerel, salmon, shark, and tuna, can replace cod liver oil if need be.

Pathological Conference, Medical College of the State of South Carolina

KENNETH M. LYNCH, M. D., PROFESSOR OF PATHOLOGY

Case of Dr. D. B. Remsen

ABSTRACT NO. 444

Present Illness: 43 year old negro man employed as chef in hotel, admitted in June, 1941 with chief complaint of "pain in left chest which shoots through to back." Six weeks prior to admission felt a fullness in his chest and he decided to go to bed. While lying in bed he had intermittent pain in left chest, which did not increase on exertion and was most severe while resting quietly. Pain described as "cutting" and traveled through to left shoulder blade; radiated only to back; excruciating at times. Had first shortness of breath three weeks ago while lying in bed.

Past History: Patient in hospital in 1938 complaining of pain in left lumbar region, back and abdomen after lifting a heavy beam. Also had signs and symptoms of peripheral neuritis in forearms and gave history of having worked in paint factory in 1922 and 1923 mixing red and white lead. During this time he had dizzy headaches, trouble with his eyes and noted that the tips of his fingers got red and he would have cramps in his hands and difficulty in opening them; also loss of sensation on back of forearms and hands; pain in calf muscles. Remained about the same for five years prior to admission in 1938. History of G. C. in 1927 followed by burning and difficulty in urination. Blood Wassermann negative and Kline positive on this 1938 admission. Received three hip and one arm shot. Discharged improved.

Physical: T. 101. R. 86. BP. 140/50. R. 24.

Revealed a well developed and well nourished negro man, sitting up in bed and moderately ill and dyspneic. Skin and mucous membranes normal. Pupils react to L & A. Ears, nose and mouth normal except for carious teeth. Lymph glands show some shotty general enlargement. Chest symmetrical and lungs resonant throughout; basal rales posteriorly. Mediastinum questionably widened. Heart enlarged to left of anterior axillary line. PMI 2 cm. outside MCL. To and fro friction rub synchronous with cardiac rhythm. Questionable diastolic murmur best heard at apex. No ascites. Liver down 2 fbs and slightly tender. Spleen not felt. No spasm or rigidity. Reflexes physiological.

Laboratory: Urinalysis (three times) showed occasional hyaline and fine granular casts. WBC varying from 3 to 30. One plus albumin on one occasion, no blood.

WBC ranged from 7,300 to 12,500; RBC around 3 million. Hb. from 7.5 to 8.5 gms; polys from 71 to 82%.

Blood Wassermann and Kline—Negative. Spinal Fluid Wassermann—negative; Kline—positive. Colloidal Gold—negative.

Two Blood Cultures positive for Strep. viridans.

Course: Temperature ranged from 99 to 103 with pulse from 90 to 130. Had several chills. Occasional sharp precordial pain. Friction rub became indistinct and to and from murmur replaced it. Definite diastolic murmur at apex which became very distinct at base also. Complained of sticking pain in right arm together with numbness and radial pulse disappeared; also developed anesthesia of anterior surface of right thigh from the knee upward for about 8 cm. Coughed up blood-tinged sputum. Became more dyspneic with more rales in lungs and expired about one month after admission.

Student G. M. Mood, Jr. (Presenting): We have an interesting case presenting a number of varied clinical findings. His blood pressure varied from 126/42 to 140/50. In 1938 he had symptoms of back strain and complained of peripheral weakness and paresthesias. A diastolic murmur was also heard at that time and his blood pressure was 140/68. On his last admission his mediastinum was widened to X-ray and it was noted during his course in the hospital that the friction rub changed in quality and the diastolic murmur became more definite. His sedimentation rate was 24 mm/hr. In the progress notes of this last entry a purpuric spot was described in the bulbar conjunctiva eight days after he entered the hospital. A pistol shot was heard over the peripheral arteries. All other information is recorded on the protocol.

Dr. Kelley (Conducting): Mr. Cobb, would you like to tell us the disease that was the cause of this man's death?

Student Cobb: In 1938 the pain of which he complained was most likely due to some form of back strain.

The peripheral neuritis, dizziness, cramps and reddening of the finger tips sounds like some form of lead intoxication, particularly since we know such a hazard was possible due to his occupation. I do not believe that gonorrhea has anything to do with his present illness. I do think, however, that the serology does have a very important bearing. From the facts that we have at hand, I think he had subacute bacterial endocarditis. If we had an adequate history of his serology and the amount of treatment he had received we would be more able to judge whether or not he had syphilis. The generalized enlargement of the lymph nodes fall in line with some form of luetic infection. Subacute

bacterial endocarditis is usually superimposed on a damaged valve. The purpuric spot in the conjunctiva spoints to embolic phenomena, whereas the chest pain traveling to the left shoulder is in keeping with a pericarditis.

Dr. Kelley: Is pericarditis usually a painful affliction?

Student Cobb: I believe it can cause pain referred to the shoulder region. Of course, the pain could have been anginal in nature.

Dr. Kelley: Then you think endocarditis killed him?

Student Cobb: Yes, indirectly. I think a pulmonary embolus killed him.

Dr. Kelley: Do you think he had any other disease besides subacute bacterial endocarditis?

Student Cobb: The serology is a crucial factor there. He certainly had signs of aortic insufficiency. Believe that he must have had syphilis, but at the time he died I think he had subacute bacterial endocarditis.

Dr. Kelley: Do you believe the subacute bacterial endocarditis was grafted on an old lesion?

Student Cobb: Yes, I think it was superimposed on an old injury, probably syphilitic involvement of the aortic valve.

Dr. Kelley: What was basis of embolus?

Student Cobb: I think fragment of vegetation broke off and went to the lungs; probably a portion also went to the radial artery.

Dr. Kelley: Mr. Lee, do you see eye to eye with Mr. Cobb?

Student Lee: I can't agree with the pulmonary embolus, but otherwise I am of about the same opinion. I think he had subacute bacterial endcocarditis, probably superimposed on syphilitic involvement of the heart.

Dr. Kelley: What do you think was the cause of death?

Student Lee: I think he died from congestive heart failure or coronary occlusion. The systolic blood pressure is rather high for congestive heart failure, but the rales, enlargement of the liver, edema and dyspnea are all part of the picture of congestive heart failure due to an incompetent valve, such as might be caused by syphilis with or without a superimposed subacute bacterial endocarditis. Narrowing of the coronary ostia by a syphilitic aortitis would give rise to anginal pains, and the fact that they were not related to exertion points to partial permanent occlusion. I don't believe pericarditis is painful unless it involves the adjacent pleura.

Dr. Kelley: Is there anything about this case that strikes you as being unusual?

Student Lee: I am unable to say; nothing particularly.

Dr. Kelley: Mr. Kerr, do you believe this man died of subacute bacterial endocarditis superimposed or cardiovascular syphilis?

Student Kerr: Yes, I do, these aforementioned conditions resulting in terminal congestive heart failure. This is an unusual combination, but it does occur.

Dr. Kelley: On what lesion is subacute bacterial endocarditis usually engrafted?

Student Kerr: Pneumonic and gonorrheal infections sometimes damage the heart valves so that their vitality is impaired and streptococci are then able to set up infection on these lesions.

Dr. Kelley: But what is the fundamental lesion, the most common and the worse one?

Student Kerr: I believe it is rheumatic heart disease, but I am not altogether sure.

Dr. Kelley: Mr. Lowe, will you put the X-ray films up and tell us what you see?

Student Lowe, (Presenting X-ray films): The heart appears definitely enlarged to the left and the aortic shadow appears widened. The lung fields show increased density as if from pneumonia or congestion. In the later films the heart appears even larger and the haziness in the lung bases appears to be definitely pneumonic.

I am not sure that the subacute bacterial endocarditis is superimposed on a syphilitic process, for the serology is usually positive in cases of cardiovascular syphilis. The most common lesion for an endocarditis to be superimposed upon is an old rheumatic valvulitis.

As regards the pericarditis, I do not believe it causes pain, unless the pleura is involved. Pericarditis with effusion will cause pain however.

Dr. Lynch: Dr. Cox will present the findings in the case, but I wish to say that I think an aneurysm of the thoracic aorta should have been mentioned as a source of the pain in the left shoulder region. I don't think it can be ignored, particularly from the clinical history alone.

Dr. Cox (Presenting heart): Syphilitic heart disease is quite common and subacute bacterial endocarditis is usually superimposed on a chronically diseased valve, usually either rheumatic or congenital. It is rare to have subacute bacterial endocarditis superimposed on a syphilitic process. We believe we have such a case here. The greatly enlarged and dilated heart weighs 800 gms. and its epicardial surfaces are roughened by adhesions. The aortic valve cusps show thickening of their free borders with widening of the commissures. The sinus of valsalva behind the right anterior aortic cusp shows aneurysmal outpouching and there is wrinkling of the intima and conxistent atheromatous plaques. There are fairly firm, shaggy vegetations fastened to the right anterior and posterior cusps and the left anterior cusps is fragmented and torn due to the destructive inflammatory process. In addition there was a focal embolic glomenulonephritis and of course all the viscera showed marked chronic passive congestion. We were unable to explore the vessels and of the arms and legs, so the

clinical findings there cannot be elaborated upon.

Dr. Robert Wilson, Jr.: The students all seem to have been very fortunate today and to have "hit the jack-pot" of correct diagnoses as it were. I would like to say, however, that in the presence of a negative Wassermann, no demonstrable dilatation of the aorta, no history of adequate treatment and then the development of subacute bacterial endocarditis certainly points away from syphilis. Of course, we do not often see rheumatic aortic valvulitis alone in this part of the world, but syphilitic aortic valvulitis in the face of the facts that I have mentioned is indeed unusual. The serology of such patients with cardiovascular syphilis is usually positive and often remains so even after adequate therapy.

The following are some *accident prevention notes* from an article in Modern Hospital, May, 1941. p. 76. Have you—

Taught your personnel to report all worn or broken equipment?

Reminded your employees to turn on lights before entering dark rooms?

Prevented falls by insisting that all dropped leafy vegetables be picked up immediately?

Required that only one-half of the corridor be washed or waxed at a time?

Provided a portable sign on a stand, "Danger—floor being waxed"?

Furnished your laboratory workers with leather gloves to be used when handling laboratory animals?

Posted signs outside the operating room, warning of explosive gases in use?

Admonished your nurses not to discard surgical blades, razor blades, and needles with the soiled linen?

Advised your nurses and laboratory workers against storing bottles of alkalis and acids on shelves above eye level, or beyond reach?

Educated nurses in proper use of a towel and water when inserting glass tubing into rubber stoppers or tubing?

Taught porters to empty waste baskets by inverting them, instead of reaching into them with their hands?

Replaced worn stairs, or made them slip-proof with strips of carborundum?

Noticed how often accidents occur as a result of inattention to work?

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

A complete technique of treatment and literature will be sent upon request

*Silver Picrate is a definite crystalline compound of silver and picric acid. It is available in the form of crystals and soluble trituration for the preparation of solutions, suppositories, water-soluble jelly, and powder for vaginal insufflation.

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SOCIETY REPORTS

The annual meeting of the Fifth District Medical Association was held at Rock Hill, October 29th. Dr. V. P. Patterson of Chester, spoke on **Medical Problems Among the Chinese**; Dr. Perry Volpitto of the University of Georgia School of Medicine, presented a paper on **The Abuse of the Barbiturate Drugs**; Captain R. A. Radke of the Fourth Evacuation Hospital, discussed **Medical Problems of Army Maneuvers**; and Dr. Robert Greenblatt of Augusta, Georgia, discussed **Dysmenorrhea.**

The following officers were elected. President, Dr. C. A. West of Camden, Vice-president, Dr. A. B. Whitaker of Camden, Secretary-Treasurer, Dr. John Brewer of Kershaw. The 1942 meeting will be held in Camden.

Dr. Sol McLendon, South Carolina State Hospital, was the speaker for the November meeting of the Chester County Medical Society. At this meeting Dr. V. P. Patterson, Chief of Staff of Pryor Hospital, invited the members to be dinner guests of the Hospital at all future meetings.

The Greenwood County Medical Society met at the Greenwood Hospital, October 21. Dr. W. A. Simpson presented a case report showing a series of rather unusual complications incident to a ruptured appendix in a seven year old child with recovery.

Dr. W. A. Hart of Columbia, was the guest speaker at the October meeting of the Florence County Medical Society. His subject, **Ante-partuum Hemorrhage.** Dr. George McCutchen of Columbia, was also present and spoke briefly on **The Use of Vitamin K in Surgery.**

At the regular meeting of the Medical Society of South Carolina, October 28th, the program was in charge of staff members of the Stark General Hospital. Colonel Meister presided and presented the following program: Major Parker C. Hardin, **The Cod Liver Oil Treatment of Burns and Other Wounds**; Lt. Frederick J. Hughes, **Certain Aspects of Pulmonary Disease Among Army Troops.**

Dr. Julian M. Ruffin of Duke University, addressed the Greenville Medical Society on November 3rd, choosing as his subject **Diagnosis and Treatment of Ulcerative Diseases of the Colon.**

Dr. Mordecai Nachman of Greenville, also presented a paper, **The Management of Nephroptosis** with a case report.

Dr. George B. Eusterman of the Mayo Clinic, was the guest speaker at the November meeting of the Columbia Medical Society. Dr. Leon S. Bryan of Columbia, also spoke on **Acne Vulgaris.**

The Fourth District Medical Society held its annual meeting at Union. The guest speaker was Major W. W. Holmes, of Camp Croft, and his subject **Obscure Phenomena Referable to the Nose and Throat.**

The following officers were elected. President, Dr. H. T. Hames of Jonesville, Vice-President, Dr. George Wilkinson of Greenville, Secretary-Treasurer, Dr. J. A. Crooks of Greenville.

The Third District Medical Society met at the State Training School, Clinton, S. C., November 18, 1941, with Dr. F. K. Shealy presiding.

It was a thrilling sight to see a demonstration of the great work that Dr. B. O. Whitten and his staff are doing at this school. The children entertained the Society with music and dancing during the dinner. Especially appealing to all the doctors was a little girl of five who was the star of the entertainment. When one of the matrons was asked who the child was she gave her

name and said, "She is our pride and joy." It is a pity that all the doctors in the state are not able to see this great school and a demonstration of the work they are doing.

The scientific part of the program was a very able paper by Dr. C. J. Scurry, of Greenwood, on the **Surgical Treatment of Varicose Veins.** Dr. Hugh Smith of Greenville presented a discussion on **Acute Interstitial Pneumonitis** which is a comparatively newly recognized disease of the respiratory track. This discussion was most interesting and was enjoyed by the entire society.

Dr. Oren Moore, of Charlotte, entertained the Society with a most useful discussion of the **Minor Disorders of Pregnancy** with a lot of wit and humor interspersed. Among the minor disturbances taken up by Dr. Moore were: nausea, ptyalism, mastitis, dental deficiencies, vaginitis, pruritis, pressure pains, cystitis, pyelitis, and varicose veins.

The Society was invited to Newberry for the next meeting in the fall of 1942. Dr. Claude Sease was elected president and Dr. H. B. Senn was elected vice-president.

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BOOK REVIEWS

SYNOPSIS OF THE PREPARATION AND AFTERCARE OF SURGICAL PATIENTS

Ilgenfritz, Penick, Maes.
Published by C. V. Mosby Company of St. Louis.
1941

The subject of this book is one that has been long overlooked in surgical literature. It offers in a clear and abstracted manner the essentials in the care of surgical patients before and after operation. In spite of the fact that it is brief there seems to be no sacrifice of completeness. The composite knowledge of many clinics is included with adequate bibliographies for those wishing to pursue particular subjects further. It is to be recommended to all practitioners of surgery but particularly to internes and residents as a ready reference book.

The only criticism which can be directed toward this book is the fact that some of the knowledge contained in it is likely to be out moded in a short while and be no more valuable than yesterday's newspaper or the match with which we just lit our cigarette. This criticism is universal in medical texts. However, the progress in the care of surgical patients in the last thirty years has been in the direction of improved pre and postoperative care and progress is so rapid that what we consider as fact today may be myth tomorrow.

G. T. McC.

PROFESSIONAL ADJUSTMENTS

Gene Garrison, A. B., R. N.
C. V. Mosby Company, St. Louis

This little volume (less than 200 pages) is presented as a textbook for freshmen students in a school of nursing. It may seem strange, therefore, to have it reviewed in a medical journal of this type.

Such was the opinion of the reviewer until he began to browse through its pages. But as he read page after page, he was convinced that the book was one which might be read with profit by every physician who is in any way connected with the nursing profession and particularly with a school of nursing. It gives an unusual insight into what the leaders of the nursing profession hope for and expect of the student nurses of today. And this can be said with assurance—if the nurses who are in our training schools today will follow the suggestions and advice contained within the pages of this book, this country will ever be proud of those who call themselves Registered Nurses.

Convincingly written in a style which is easy to read, undertoned with a keen sense of humor, this small volume should serve well as a textbook in any school of nursing and should, at the same, be welcomed by any physician as parallel reading.

The following quotations are selected at random and might well serve as good advice for those for whom the book was not written—the physicians themselves:

"Never talk about yourself to the patients. After all, they are not interested in you and your affairs."

"The doctor of today does not expect the student to be a piece of machinery, however expert. He wants her to be a thinking, reasoning human being, who can help him in his work, who can observe, and properly interpret what she sees."

"The student who is not honest fails in playing fair. If she wastes or destroys hospital property; if she uses a hospital towel to polish her shoes; if she appropriates the belongings of her schoolmates; if she fails to turn off lights when they are no longer needed; if the student does such things, she is as dishonest as the man or woman who robs a bank."

"There is nothing more pleasing than the sight of a group of nurses, student or graduate, dressed in uniforms that are neat and clean. There is no more unpleasant sight than a nurse in a uniform that is soiled and ragged."

"There is no place in which good breeding or its lack shows up more clearly than at the table."

"No student should ever let herself become so narrow minded, so embedded in a rut, that she can talk nothing but shop. Even the lowliest patient on the ward would best be left in her bed when the student goes to lunch."

"Patients are people, not things. The student should never permit herself to become mechanical."

"In the last analysis, every principle needed in a code of ethics may be found in the statement that the nurse should always act for the good of her patient."

"There is no justification in telling falsehoods to little children about anything. They are certain to find you out."

"Attainment is never inherited."

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NEWS ITEMS

The *Southern Medical Association* was well represented by South Carolina physicians.

The following men presented original papers: Drs. William H. Kelley, Charleston, S. C.; J. Richard Allison, Columbia, S. C.; Ben Wyman, Columbia, S. C.; and Julian P. Price, Florence, S. C.

Among those taking part in the discussion of the regular papers were Drs. J. Warren White of Greenville, Ruskin G. Anderson of Spartanburg, J. W. Jervey, Jr., of Greenville, and C. L. Guyton of Columbia.

Dr. William Weston, Jr. of Columbia served as Secretary of the Pediatric Section and was re-elected to that office.

In addition to the above the following men from South Carolina were registered as attending: Drs. J. M. Davis, Columbia; Jas. S. Fouche, Columbia; Donald E. Michie, Marion, Robert E. Seibels, Columbia; Wm. A. Strickland, Westminster; Martin B. Woodward, Columbia; Martin D. Young, Columbia; H. G. Callison, Columbia; Roy L. Cashwell, Greenville; C. P. Corn, Greenville; J. R. Dunn, Sumter; J. W. Jervey, Greenville; T. R. Littlejohn, Sumter; G. S. T. Peeples, Columbia; W. H. Poston, Pamplico; A. M. Scarborough, Greenville; G. M. Truluck, Orangeburg; F. E. Zemp, Columbia; J. Fred Crow, Spartanburg; J. A. Hayne, Columbia; G. E. McDaniel, Columbia; Hilla Sheriff, Columbia; Sedgwick Simons, Columbia.

Friends of Dr. Randolph Jones, Surgeon of Duke Medical School were shocked to hear of the tragedy which resulted in his violent death on November 18th. The many friends of Dr. Jones in South Carolina sympathize with his wife and child and with the University with which he was connected, in his sudden passing.

Dr. W. L. A. Wellbrock, formerly with the Bradford Hospital, Bradford, Pa., is now with the United States Naval Hospital, Quantico, Va.

Dr. George Durst, who is now stationed at Fort Jackson, was in Greenwood recently for a short visit.

Dr. Hugh Cathcart has been transferred from Indiantown Gap, Pa. to Walter Reed Hospital, Washington, D. C.

The secretary of the Kershaw Medical Society has announced the establishment in Kershaw County of a Public Health Clinic for contraception and child spacing program for those individuals where regulation of pregnancies or prevention of pregnancies is thought necessary.

Dr. W. E. Saye has recently opened an office for the general practice of medicine at 1515 Bull Street, Columbia. For the past few years Dr. Saye has been connected with the Veterans Hospital.

Dr. and Mrs. James O'Hear, of 11 Franklin street, were forced to spend a night on Bird's key without food or shelter because a rolling sea made impossible a return trip in their small motor boat.

Dr. and Mrs. O'Hear left from Mount Pleasant on a fishing trip in a rented boat. The high winds caught them on Bird's key and although the tiny island is located above high water level, the couple was unable to reach the mainland again until the next morning.

"The fish were biting nicely," said Dr. O'Hear, "and I caught several large ones. But before we knew it we were marooned, the winds got stronger and stronger, and the sea rougher."

Fortunately there was a large palmetto log on the island and the doctor said he dug in one side to make a shelter to protect them from the wind.

"What a night," said Dr. O'Hear. "We got full of sand. I actually had to scrub it out of my day-old beard. But I believe it cured by cold."

Since sprains of the ankle joint are the most common injuries seen in every day practice the following method of *ankle strapping*, presented by Lieutenant Commander G. D. Delprat (U. S. Naval Medical Bulletin, October, 1941) is of interest.

"The adhesive strapping is applied in the following manner:

"After carefully shaving the leg from the knee to the ankle, a 2-inch strip of adhesive of sufficient length is applied, commencing just below the internal malleolus, is passed across the sole of the heel and held in close apposition to the head of the fibula. At the same time the ankle is held at flexion to a right angle, and with as much eversion of the foot as is possible to obtain.

"The adhesive is then applied to the side of the leg, under tension, and held by the patient's fingers at the head of the fibula.

"A second strip of adhesive is then applied, holding the adhesive in apposition to the leg at the region of the external malleolus. This strip does not circle the leg, but leaves a space one inch or more wide over the Achilles tendon.

"Theoretically, this support should be sufficient to splint the torn external lateral ligament, but actually if the procedure is stopped at this point, edema will occur over the foot distal to the circular strip. To prevent the formation of this edema, further strips of adhesive are applied surrounding the foot from the fold at the toes up to the first circular strip applied. All these strips, however, leave a space along the sole of the foot, and none of them overlap or press upon the Achilles tendon.

"A circular bandage is finally applied, serving to hold the adhesive in tight apposition to the skin, which is left in place for 24 hours. The adhesive is left on as long as 10 days if the skin tolerates the presence of the plaster, at the end of which time it may be replaced if necessary. On some individuals the entire dressing is changed after 4 or 5 days if it seems that the skin does not well tolerate the adhesive.

"The advantages of this type of strapping are obvious. It serves to support the torn external lateral ligament by means of a wide strong strip of adhesive extending as far up the lower leg as possible, and therefore capable of taking up the strain and preventing the ankle being turned outward. The freedom of the Achilles tendon is very important, and no circular bandage should ever be applied which presses upon it.

"Even with severely injured ankles and marked swelling and pain it has been possible to return men to active work immediately after the application of the above strapping. Such results are certainly not possible with the narrow overlapping straps frequently applied about the ankle joint."

That the *sulfonamide drugs* are not a panacea for all ailments is gradually being recognized and more and more these drugs are assuming an important and definite place but not an all inclusive space in our armamentarium. In discussing these drugs H. F. Flippin (Journal of the Missouri Medical Association, October, 1941) emphasizes the importance of recognizing failure of drug therapy as follows.

"The failure of a patient suffering with an infection to respond to sulfonamide therapy within from forty-eight to seventy-two hours usually suggests several possibilities. First, a localized supperative process such as empyema may be present, in which case surgical intervention is indicated. Second, there may be an overwhelming infection with spread, probably accompanied by blood stream involvement. Such cases should be given the benefit of serum in addition to the drug. Third, the causative agent of the infection may be an organism not susceptible to the drug, such as a virus. If, after seventy-two hours of chemotherapy, no improvement is noted the drug is best stopped. It is important that once treatment with one of these drugs is started it should be continued, unless severe toxic reactions occur, until a complete clinical cure is obtained. Not infrequently a recurrence or spread in the infection will occur if treatment is discontinued too early. A fall in temperature often proves deceptive and the importance of carefully performed physical studies to detect possible extension of the infectious process is indicated."

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To quarantine or not to quarantine is a question which is coming up for more and more debate. Following a general discussion of the subject ARE PRESENT DAY QUARANTINE METHODS ARCHAIC, A. L. Hoyne draws the following conclusions: (Illinois Medical Journal, Sept., 1941).

"1. The usual quarantine regulations for the control of the common contagious diseases have been an utter failure.

2. Contagious disease patients and susceptible contacts should be isolated.

3. In most instances, placarding of premises has no scientific value if the family concerned possesses average intelligence, and if the home is visited at proper intervals by a field nurse or health officer.

4. Infectious disease hospitals should be maintained primarily for those patients who require hospital treatment.

5. Satisfactory control of the common contagious diseases is only possible in those infections for which an efficient immunizing agent is available."

That these ideas are not acceptable by all is brought out by W. H. Tucker in a discussion of this paper who says:

"In summarizing I wish to repeat that it is my opinion that quarantine and placarding have made a definite contribution to communicable disease control. It is not wise to enforce quarantine regulations in a dogmatic manner nor is it wise to be lax and careless. We have found that firm enforcement of quarantine, combined with a program of health education of the patient and parent by the physician and public health nurse have been effective in communicable disease control."

With the winter season approaching more and more members of the sulfonamide group will be prescribed by physicians and it is well that we keep in mind the following advice which appeared in the Journal of the American Medical Association (May 17, 1941).

"Many therapeutically effective drugs influence the physiologic mechanisms, psychomotor reactions or judgment of persons who take them. When given to patients at rest in bed such drugs have been established as beneficial to the patient and of course harmless to other persons. Under some circumstances, however, drugs may have effects potentially dangerous to both patient and community. Not long ago a locomotive engineer who was taking sulfanilamide for an infection of the bladder was involved in an accident in which considerable property damage was done and a number of people were injured. He described the event as follows:

'Approaching the station where the accident occurred, a feeling of lassitude seems to have crept over me unawares and to the extent that I do not have much recollection of what went on for the last two or three miles. I was sitting on my seat, looking out and feeling that I was on the alert. . . Actually I was not on the job with all my faculties. I passed landmarks customarily used to locate position without seeing them, even to the station board; and it was only when the hazard became imminent that I was aroused out of it and became efficient.'

"Already physicians have ruled that airplane pilots must not fly until four days have elapsed after they have received any of the sulfonamide group. Patients engaged in mechanical work of any kind should not take sulfanilamide except when relieved from their responsibilities.. Physicians thus have a definite obligation when prescribing sulfanilamide. Patients should be cautioned preferably to stay at home and at rest while taking the drug and not to drive an automobile, make any important decision or sign any papers while the drug is being administered. Such recommendations seem especially advisable in view of the insidiously developing reactions of sulfanilamide when compared with such drugs as the bromides and the barbiturates."

Not only physicians but the public at large are becoming more and more *brucellosis* minded. The present status relative to the diagnosis of this condition is well summarized by Dr. F. T. McIntire in the May, 1941 issue of the Texas State Journal of Medicine.

"1. There are serious imperfections, limitations, and contradictory observations concerning available laboratory data.

2. There are no acceptable clinical criteria upon which to base a diagnosis of brucellosis.

3. The positive culture is the only absolutely diagnostic laboratory test.

4. One is not justified in making the diagnosis simply on the basis of one positive test, except the culture.

5. One is justified in making the diagnosis without positive culture, if the history and physical findings are in keeping with brucellosis, if other diseases capable of producing the same clinical picture can be excluded, and if at least two of the confirmatory tests are positive."

WOMAN'S AUXILIARY

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Greenville, S. C.

New Auxiliary is Organized

On September 24th nineteen doctor's wives met in Orangeburg, S. C., and, with the assistance of Mrs. J. W. Kitchin, organizing chairman of the Auxiliary to the South Carolina Medical Association, Mrs. Richard M. Pollitzer, President, and Mrs. W. B. Furman, Past President, organized the Auxiliary to the Edisto Medical Society.

The officers of the new Auxiliary are Mrs. George Truluck, President, Mrs. L. P. Thackston, Vice President, Mrs. W. O. Whetsell, Secretary, and Mrs. O. Z. Culler, Treas.

The members of this auxiliary plan to hold monthly meetings, after which lunch will be served.

We extend greetings to these new members, and wish for them close fellowship and much success in the activities in which they engage.

Cancer Control Campaign in Greenville

A series of educational cancer control programs have recently been promoted by the Auxiliary to the Greenville County Medical Society, of which Mrs. M. Nachman is president. Mrs. John Drake, State Chairman of the Woman's Field Army for Cancer Control, addressed seven of these meetings. Following this series the Greenville Auxiliary has been asked to furnish speakers for eight clubs which wish to present the subject of cancer control to their members. It is estimated that 2500 people have been reached through these programs.

HYGEIA, The Health Magazine

The first issue of this popular magazine appeared on April 26, 1923. The American Medical Association had long urged the publication of a health magazine. Hygeia has filled that long felt need.

Its Aims and Purposes

1. To supply its many subscribers in their wide fields of endeavor with reliable, informative material concerning health.

2. To interpret scientific medicine to the public in simple non-technical language.

3. To flay the quack who undermines the mental and physical health of the public.

4. To discourage self-medication and faddistic tendencies.

5. To reduce mortality and morbidity to its lowest possible level.

6. And to encourage healthful living and community hygiene.

As wives of doctors, we know that Hygeia presents authentic information on scientific subjects including that of nutrition, in understandable form, for lay readers. We realize the value of nutrition in National Defense. Hygeia is now running a series of valuable articles on nutrition, which will no doubt be welcomed by program chairmen.

The following suggestions are offered to county Hygeia chairmen:

1. Give complimentary subscriptions of Hygeia to N. Y. A. and Adult Education centers.

2. Promote Hygeia exhibits at county fairs by installing health booths where sample copies may be displayed.

3. Hygeia should be on the physicians and dentists' reception room tables.

4. Place Hygeia in all schools, public libraries, intern and nurses quarters in hospitals, rest rooms, beauty parlors, barber shops and institutions of all kinds. Gift subscriptions at Christmas time may be the best means of starting interest in Hygeia and result in paid subscriptions later.

Meet the challenge offered to us by the national program on health defense by cooperating 100% with each other and with the Circulation Manager of Hygeia to the end that this publication will reach those in every community who are confused with misinformation on health.

Ask your State Chairman about contest and prizes.

Mrs. Delmar O. Rhame
State Hygeia Chairman

Mrs. Richard Pollitzer, president of our auxiliary, was appointed to membership on the State Nutrition Committee by Gov. Burnett R. Maybank on Nov. 1st.

Mrs. Pollitzer was elected to the Board of Directors of the South Carolina Tuberculosis Association at the November meeting of that body.

Dr. B. Owen Ravenel, Roper Hospital, Charleston, S. C., has been elected a member of the Medical Society of S. C. at Charleston.

The six cardinal principles of treating *tetanus* are presented by E. M. Chapman and R. H. Miller in the New England Journal of Medicine, October 23. 1941.

"1. Profound sedation.
2. Surgical removal of the focus of tetanus.
3. Moderate intravenous dosages of tetanus antitoxin.
4. Frequent lumbar punctures.
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Ariail, C. C.---Greenville, S. C.
Ariail, R. H.---Laurens, S. C.
Asbill, D. S.---Columbia, S. C.
Asbill, F. G.---Ridge Spring, S. C.
Assey, J. T.---Georgetown, S. C.
Assey, P. E.---Georgetown, S. C.

Bailey, C. W.---Spartanburg, S. C.
Bailey, H. P.---Greenville, S. C.
Baker, A. E.---Charleston, S. C.
Baker, B. R.---Charleston, S. C.
Baker, C. R. F.---Sumter, S. C.
Baker, H. L.---Hemingway, S. C.
Baker, R. J.---Charleston, S. C.
Baldwin, Marie---Due West, S. C.
Baldwin, W. E.---Walhalla, S. C.
Ball, J. A.*---Charleston, S. C.
Ball, R. W.---Columbia, S. C.
Ball, W. J.---Charleston, S. C.
Ballenger, A. L.---Batesburg, S. C.
Banov, Leon---Charleston, S. C.
Bare, Goodman---Anderson, S. C.
Barksdale, I. S.---Greenville, S. C.
Barnes, L. P.---Bennettsville, S. C.
Barnwell, E. H.†---Martin's Point, S. C.
Barron, E. W.---Columbia, S. C.
Barron, W. R.*---Columbia, S. C.
Barron, W. T.---Columbia, S. C.
Bates, C. O.---Greenville, S. C.
Bates, P. T.---Greenville, S. C.
Bates, W. L.---Greenville, S. C.
Battle, G. C.---Columbia, S. C.
Beach, M. W.---Charleston, S. C.
Bearden, J. D.---Central, S. C.
Beasley, W. J.---Hartsville, S. C.
Beckman, J. C.---Charleston, S. C.
Beckman, W. P.---Columbia, S. C.
Bedenbaugh, J. I.---Prosperity, S. C.
Behling, A. S.---St. George, S. C.
Belk, J. R.---Kershaw, S. C.
Bell, F. A.---Georgetown, S. C.
Bell, J. W.*---Walhalla, S. C.
Benet, George---Columbia, S. C.
Bennett, Thomas W.†---Columbia, S. C.
Bennett, W. M.---Ruffin, S. C.
Benson, C. P.---Aspinwall, Penn.
Berger, Morley---Columbia, S. C.
Berry, R. R.*---Union, S. C.
Bethea, W. S.---Latta, S. C.
Bigger, D. A.---Rock Hill, S. C.
Bishop, B. C.---Greenville, S. C.
Bishop, W. G.---Greenwood, S. C.
Black, A. L.---Bowman, S. C.
Black, Herbert M.†---Walterboro, S. C.
Black, H. S.---Spartanburg, S. C.
Black, Robert*---Bamberg, S. C.
Black, S. O.---Spartanburg, S. C.
Black, W. A.---Beaufort, S. C.
Blackmon, S. J.---Kershaw, S. C.
Blackmon, W. R.---Rock Hill, S. C.
Blake, C. H.---Greenwood, S. C.
Blake, Herbert---Anderson, S. C.
Blakey, R. A.---Greenville, S. C.
Blanchard, A. S.---Williston, S. C.
Blanchard, F. A.---Bishopville, S. C.
Boatwright, P. J.---Orangeburg, S. C.
Boette, Chas. D.---Charleston, S. C.
Boggs, Lonita---Greenville, S. C.
Boggs, L. W.---Greenville, S. C.
Bolin, G. C.---Orangeburg, S. C.
Booker, J. P.---Walhalla, S. C.
Boone, John A.---Charleston, S. C.
Boone, J. E.---Columbia, S. C.
Boone, L. D.---Aiken, S. C.
Boone, Walter---Gaffney, S. C.
Boozer, A. E.*---Columbia, S. C.
Bowen, Harold J., Jr.†---Charleston, S. C.
Bowen, W. C.*---Belton, S. C.
Bowers, T. E.---Charleston, S. C.
Boyd, W. A.*---Columbia, S. C.
Boyd, W. W.---Spartanburg, S. C.
Bozard, A. C.---Manning, S. C.
Brabham, Jas. C.---Union, S. C.
Brabham, V. W., Jr.---Kingstree, S. C.
Brabham, V. W.---Orangeburg, S. C.
Brackett, N. C.---Pickens, S. C.
Brailsford, A. M.---Camden, S. C.

Branford, W. V.----Dillon, S. C.
Brannon, L. J.----Columbia, S. C.
Bratton, J. R.----Rock Hill, S. C.
Bratton, R. A.*----York, S. C.
Breeland, W. H.----Allendale, S. C.
Brewer, J. M.----Kershaw, S. C.
Brice, J. M.----Kingstree, S. C.
Bristow, W. J.----Columbia, S. C.
Brockman, H. L.----Greer, S. C.
Brockman, W. T.----Greenville, S. C.
Brodie, J. E.----Greenwood, S. C.
Brogden, M. L.----West Columbia, S. C.
Brooks, T. G.----Aiken, S. C.
Brown, Eugene----Greenville, S. C.
Brown, G. C., Jr.†----Walterboro, S. C.
Brown, Kyle----Greenville, S. C.
Browning, A. W.----Elloree, S. C.
Bruce, J. L.----Florence, S. C.
Bruce, R. C.----Greenville, S. C.
Brunson, Francis----Sumter, S. C.
Brunson, J. E.----Taylors, S. C.
Brunson, J. W.†----Camden, S. C.
Brunson, P. A.----Ridge Spring, S. C.
Brunson, Sophia*----Sumter, S. C.
Bryan, L. S.----Columbia, S. C.
Bryson, E. J.----Liberty, S. C.
Buist, A. J., Jr.†----Charleston, S. C.
Buist, A. J.----Charleston, S. C.
Bullock, C. T.----Columbia, S. C.
Bultman, R. B.----Sumter, S. C.
Bunch, G. H.*----Columbia, S. C.
Bundy, J. L.----Rock Hill, S. C.
Burgess, W. H.----Sumter, S. C.
Burgess, W. S.----Sumter, S. C.
Burn, J. W.*----Charleston, S. C.
Burnside, A. F.----Columbia, S. C.
Burton, C. H.----Iva, S. C.
Byerly, W. L.----Hartsville, S. C.

Cain, Frank G.----Charleston, S. C.
Cain, J. P., Jr.----Mullins, S. C.
Callison, H. G.----Columbia, S. C.
Camp, Ned----Anderson, S. C.
Campbell, S. D.----Piedmont, S. C.
Campbell, T. A.----Blacksburg, S. C.
Cannon, J. H.----Charleston, S. C.
Carnes, W. C.----Lancaster, S. C.
Carpenter, E. W.*----Greenville, S. C.
Carpenter, F. L.----Latta, S. C.
Carpenter, W. S.----Greenville, S. C.
Carrigan, G. B.----Columbia, S. C.
Carrigan, W. A.*----Society Hill, S. C.
Carrigan, W. H.----Summerton, S. C.
Carroll, J. W.----Russellville, S. C.
Carroll, T. B.----Hardeeville, S. C.
Carter, J. T.----Spartanburg, S. C.
Cashwell, R. L.----Greenville, S. C.
Cathcart, Hugh----Charleston, S. C.
Cathcart, J. H.----Gaffney, S. C.
Cathcart, R. S.*----Charleston, S. C.
Caughman, B. D.----Columbia, S. C.
Chambers, G. W.----Anderson, S. C.
Chamberlain, O. B.----Charleston, S. C.
Chance, F. S.----Chester, S. C.
Chandler, J. J.----Sumter, S. C.
Chapman, J. W.----Walterboro, S. C.
Chapman, W. H.----Whitney, S. C.
Chappell, B. S.----Columbia, S. C.
Cheatham, M. W.----Columbia, S. C.
Clark, N. T.----Spartanburg, S. C.
Clatworthy, J. W.----W. Greenville, S. C.
Claussen, J. R.----Florence, S. C.
Clayton, H.*----Hopkins, S. C.
Cleckley, J. J.----Bamberg, S. C.
Clinkscales, G. S.----Anderson, S. C.
Cockfield, R. L.----Lake City, S. C.
Coleman, F. P.----Columbia, S. C.
Coleman, L. H.----Spartanburg, S. C.
Coleman, Stanley----Traveler's Rest, S. C.
Coleman, T. E.----Traveler's Rest, S. C.
Cone, Wallis†----Williston, S. C.
Connor, P. M.----Neeses, S. C.
Converse, J. P.----Greenville, S. C.
Corbett, J. W.*----Camden, S. C.
Corn, C. P.----Greenville, S. C.
Crawford, R. L.----Lancaster, S. C.
Crawley, W. G.----Lancaster, S. C.
Crook, Martin----Spartanburg, S. C.
Crooks, J. H.----Greenville, S. C.
Crosby, C. E.----Greenwood, S. C.
Crosland, Joe----Greenville, S. C.
Crosson, James----Leesville, S. C.
Cudd, J. E.----Spartanburg, S. C.
Culbreath, Paul----Ellenton, S. C.
Culler, O. Z.----Orangeburg, S. C.
Cutchin, Joe H.----Easley, S. C.
Cuttino, J. T.†----Columbia, S. C.

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Daniels, F. M.----Greenville, S. C.
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Darwin, J. T.*----Gaffney, S. C.
Davenport, J. F.----Timmonsville, S. C.
Davis, J. M.----Columbia, S. C.
Davis, J. T.----Walhalla, S. C.
Davis, J. W.*----Clinton, S. C.
Davis, L. C.----Columbia, S. C.
Dawson, George----Charleston, S. C.
Deas, Henry----Charleston, S. C.
Dendy, W. S.----Pelzer, S. C.
DeSaussure, H. W.----Charleston, S. C.
Desportes, J. R.----Fort Mill, S. C.
Dibble, E. M.*----Marion, S. C.
Dillard, J. A.----Columbia, S. C.
Dobson, J. F.----Ridgeway, S. C.
Donnald, E. R.----Honea Path, S. C.
Donnon, J. L.*----Ware Shoals, S. C.
Dotterer, T. D.----Columbia, S. C.
Doughty, R. G.----Columbia, S. C.
Dove, H. R.----Columbia, S. C.
Doyle, E. C.*----Seneca, S. C.
Doyle, W. R.*----Seneca, S. C.
DuBose, T. M., Jr.----Columbia, S. C.

Dulin, T. N.*—Clover, S. C.
Dunlap, J. O.—Rock Hill, S. C.
Dunn, J. R.—Sumter, S. C.
Dunnovant, R. B.—Edgefield, S. C.
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Durham, R. B.—Columbia, S. C.
Durst, Geo. G.†—Greenwood, S. C.
Dwight, F. M.*—Sumter, S. C.

Eaddy, A. M.—Columbia, S. C.
Eaddy, N. O.—Sumter, S. C.
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Earle, Bayliss—Greenville, S. C.
Earle, C. B.*—Greenville, S. C.
Earle, J. B.*—Greenville, S. C.
Eaves, J. V.—Langley, S. C.
Edwards, G. B.*—Darlington, S. C.
Edwards, H. A.—Latta, S. C.
Edwards, J. B.—Swansea, S. C.
Edwards, P. H.—Conway, S. C.
Edwards, W. W.†—Greenville, S. C.
Elliott, J. B.—Fort Mill, S. C.
Ellis, D. W.—Charleston, S. C.
Elvington, R. F.—Lake View, S. C.
Epps, C. B.—Sumter, S. C.
Epting, C. H.—Columbia, S. C.
Epting, E. E.—Anderson, S. C.
Eskrigge, Edith—Columbia, S. C.
Estes, Amos C.—Winnsboro, S. C.
Evans, Dexter M.—Lake City, S. C.
Evans, William—Bennettsville, S. C.
Evatt, Clay W.—Charleston, S. C.

Fair, C. H.†—Greenville, S. C.
Fairey, T. K.—Johnston, S. C.
Farmer, Rudolph—State Park, S. C.
Fender, M. S.—Ehrhardt, S. C.
Fennell, J. L.*—Waterloo, S. C.
Fennell, W. W.—Rock Hill, S. C.
Fewell, John M.—Greenville, S. C.
Fewell, W. S.—Greenville, S. C.
Fike, A. R.—Spartanburg, S. C.
Finger, Elliott†—Marion, S. C.
Finklea, O. T.—Florence, S. C.
Finney, C. S.—Spartanburg, S. C.
Finney, Roy P.—Spartanburg, S. C.
Fishburn, S. B.*—Columbia, S. C.
Fishburn, W. K.—Monks Corner, S. C.
Fleming, J. M.—Spartanburg, S. C.
Floyd, J. B.—Great Falls, S. C.
Floyd, L. C.—Olanta, S. C.
Folk, J. L.—Fairfax, S. C.
Folk, W. H.—Spartanburg, S. C.
Ford, Fred —St. Matthews, S. C.
Forte, J. A.—North, S. C.
Fouche, J. A.—Columbia, S. C.
Fouche, J. W.—Columbia, S. C.
Fox, W. M.†—Columbia, S. C.
Frampton, James*—Charleston, S. C.
Frampton, W. H.—Charleston, S. C.
Freed, J. E.—Columbia, S. C.
Fulenwider, J. O.—Pageland, S. C.
Fuller, R. M.—Greenwood, S. C.
Fulmer, W. E.*—Columbia, S. C.
Funderburke, I. S.—Cheraw, S. C.
Furman, R. B.*—Sumter, S. C.
Furman, Thos. C.—Greenville, S. C.

Gaillard, P. C.†—Beaufort, S. C.
Gaines, T. R.—Anderson, S. C.
Gantt, R. B.—Charleston, S. C.
Garrett, J. F.—Greenville, S. C.
Garvin, O. D.—Spartanburg, S. C.
Gaston, F. P.—Rock Hill, S. C.
Gaston, J. N., Jr.—Chester, S. C.
Gaston, J. N., Sr.—Edgmoor, S. C.
Gaston, S. R.—Traveler's Rest, S. C.
Geiger, F. W.—Columbia, S. C.
George, W. E.†—West Columbia, S. C.
Gibbes, J. H.—Columbia, S. C.
Gibbes, R. W.*—Columbia, S. C.
Gibbs, W. R.—Buffalo, S. C.
Gibson, W. T.—Batesburg, S. C.
Giles, C. T. J.*—Greenville, S. C.
Gilmore, H. S.—Nichols, S. C.
Glennon, T. L.—Denmark, S. C.
Goings, J. G.*—Union, S. C.
Goldsmith, T. G.—Greenville, S. C.
Goodlett, O. M., Jr.—Pelzer, S. C.
Goodwin, C. I.—Holly Hill, S. C.
Graham, Chas. M.—Clio, S. C.
Gray, J. L.*—Anderson, S. C.
Green, D. W.†—Conway, S. C.
Green, J. T.—Columbia, S. C.
Gregg, D. B.—Columbia, S. C.
Griffin, H. H.*—Columbia, S. C.
Griggs, D. C.—Pageland, S. C.
Grigsby, W. D.—Blaney, S. C.
Grimball, I. H.—Greenville, S. C.
Gross, H. A.—Barnwell, S. C.
Guess, J. D.—Greenville, S. C.
Guignard, J. B.*—Columbia, S. C.
Guyton, C. L.—Columbia, S. C.

Haddock, S. H.—Anderson, S. C.
Hair, J. T.—Aiken, S. C.
Hall, H. F.†—Columbia, S. C.
Hall, H. T.—Aiken, S. C.
Hall, J. C.—Gaffney, S. C.
Hall, L. F.—State Park, S. C.
Hall, T. G.—Westminster, S. C.
Hall, W. S.—Columbia, S. C.
Ham, Coy—Columbia, S. C.
Hames, H. T.—Jonesville, S. C.
Hamilton, R. G.—Columbia, S. C.
Hanckel, R. W.—Charleston, S. C.
Hardy, B. F.—Dillon, S. C.
Harper, J. C.—Greenwood, S. C.
Harper, T. B.—St. Stephens, S. C.
Harris, H. H.—Anderson, S. C.
Harris, J. C.—Lancaster, S. C.
Harrison, J. D.—Greenwood, S. C.
Harrison, J. P.—Cheraw, S. C.
Hart, J. G.—Laurens, S. C.
Hart, W. A.—Columbia, S. C.
Harter, J. W.—Orangeburg, S. C.

Harvin, W. S.---Manning, S. C.
Hay, P. D.---Florence, S. C.
Hay, L. S.---Rock Hill, S. C.
Hayne, Isaac---Congaree, S. C.
Hayne, J. Adams*---Columbia, S. C.
Haynes, Jas. A.---Hampton, S. C.
Haynie, Jas. W.---Honea Path, S. C.
Haynie, W. R.*---Belton, S. C.
Hays, S. C.---Clinton, S. C.
Hearin, W. C.---Greenville, S. C.
Hearn, Paul P.---Greenville, S. C.
Heidt, G. F.---Charleston, S. C.
Hemingway, T. S.---Kingstree, S. C.
Hendrix, W. T.---Spartanburg, S. C.
Hennies, Geo. A.---Chester, S. C.
Henry, B. A.*---Anderson, S. C.
Henry, W. J.---Chester, S. C.
Hentz, E. O.---Anderson, S. C.
Herbert, H. W.---Florence, S. C.
Herlong, E. E.---Rock Hill, S. C.
Herring, H. D.---St. George, S. C.
Hewitt, Ragsdale ---Sumter, S. C.
Heyward, N. B.---Columbia, S. C.
Hicks, E. M.---Florence, S. C.
Hicks, W. E.---Timmonsville, S. C.
Hiers, H. G.---Bamberg, S. C.
Hill, C. C.*---Darlington, S. C.
Hill, John B.---Greenville, S. C.
Hill, J. C.*---Abbeville, S. C.
Hill, R. D.---Pacolet, S. C.
Hinson, A.---Rock Hill, S. C.
Hiott, J. T.---Charleston, S. C.
Hogan, O. F.---Greelyville, S. C.
Holley, O. C.---Leesville, S. C.
Holloway, W. J.---Ware Shoals, S. C.
Holloway, W. O.---Chappells, S. C.
Holman, D. O.---Timmonsville, S. C.
Holman, J. M.†---Charleston, S. C.
Holmes, Gertrude---Greenville, S. C.
Holmes, H. B.---Conway, S. C.
Holtzclaw, J. N.---Greenville, S. C.
Hood, E. C. ---Darlington, S. C.
Hood, W. A.*---Hickory Grove, S. C.
Hook, M. W.---Cheraw, S. C.
Hope, A. C.---Union, S. C.
Hope, H. P.---Union, S. C.
Hope, R. M.---Charleston, S. C.
Hopkins, T. J. ---Columbia, S. C.
Horger, E. L. ---Columbia, S. C.
Horger, E. O. ---Greenville, S. C.
Horton, C. C.---Pendleton, S. C.
Hoshall, F. A.---Charleston, S. C.
Houck, T. H.---Florence, S. C.
Houseal, R. W.---Newberry, S. C.
Houston, R. E.---Greenville, S. C.
Howell, J. R.---Aiken, S. C.
Howell, J. T.---Florence, S. C.
Hughes, Jas. L.---Greer, S. C.
Hughston, Geo. F.---Fairforest, S. C.
Humphries, A. W.---Camden, S. C.
Hunsucker, W. C.---Bennettsville, S. C.
Hunter, J. H.---Spartanburg, S. C.
Hunter, P. W.---York, S. C.
Hutchinson, M. E.---Columbia, S. C.
Huth, P. E.---Sumter, S. C.

Jackson, D. B.---Greer, S. C.
Jacobs, C. D.---Kingstree, S. C.
James, F. G.*---Greer, S. C.
Jeanes, R. P.†---Easley, S. C.
Jenkins, P. G.---Charleston, S. C.
Jennings, Douglas---Bennettsville, S. C.
Jervey, J. W., Jr.---Greenville, S. C.
Jervey, J. W.*---Greenville, S. C.
Johnson, A. H.---Hemingway, S. C.
Johnson, F. B.---Charleston, S. C.
Johnson, Geo. D.---Spartanburg, S. C.
Johnson, A. R., Jr.---St. George, S. C.
Johnston, B. R.---Estill, S. C.
Johnston, J. B.---St. George, S. C.
Jordan, F.*---Greenville, S. C.
Josey, A. I.---Columbia, S. C.
Josey, J. C.---Spartanburg, S. C.
Josey, R. B.---Columbia, S. C.
Judy, W. S.---Greenville, S. C.

Kalayjian, Bernard ---Charleston, S. C.
Keisler, D. S.---Leesville, S. C.
Kell, T. B.*---Fort Lawn, S. C.
Kelley, E. T.---Kingstree, S. C.
Kelley, W. H.---Charleston, S. C.
Kendall, B. W.---Columbia, S. C.
Kennedy, F. A.---Langley, S. C.
Kennedy, G. I.---Ninety-Six, S. C.
Keyserling, B. H.†---Beaufort, S. C.
Kibler, C. L.*---Columbia, S. C.
Kinard, D. D.---Greenwood, S. C.
King, E. H.---Hartsville, S. C.
King, H. B.---Lake City, S. C.
King, W. W.---Batesburg, S. C.
Kinney, C. A.---Florence, S. C.
Kinney, P. M.---Bennettsville, S. C.
Kirkpatrick, L. R.---Belton, S. C.
Kitchin, J. W.---Liberty, S. C.
Kneece, J. F.---Blackville, S. C.
Knowlton, H. A.---Spartanburg, S. C.
Koontz, L. A.†---Charleston, S. C.
Kredel, F. E.---Charleston, S. C.

LaBorde, J. B.---Columbia, S. C.
Lancaster, W. B.---Spartanburg, S. C.
LaRoche, J. J.---Charleston, S. C.
Lassex, A. M.---Charleston, S. C.
Latimer, J. B.---Anderson, S. C.
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Lawther, F. R. ---Monks Corner, S. C.
Ledbetter, F. C.---Greenville, S. C.
Lee, Lamar---Florence, S. C.
Lemmon, C. J.*---Sumter, S. C.
Leonard, O. W.---Spartanburg, S. C.
Lester, W. E.---Mullins, S. C.
Lide, C. M.†---Columbia, S. C.
Lide, L. M.---Florence, S. C.
Linton, I. G.†---Charleston, S. C.
Lippert, K. M.---Lancaster, S. C.

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Littlejohn, T. R.—Sumter, S. C.
Livingston, Robt—Fountain Inn, S. C.
Liverman, J. S.—Lexington, S. C.
Long, E. W.—Columbia, S. C.
Long, V. A.—Prosperity, S. C.
Love, S. G.—Rock Hill, S. C.
Lowman, A. W.—Denmark, S. C.
Lucas, S. R.—Florence, S. C.
Lucas, T. L.†—Charleston, S. C.
Luttrell, L. W.—Walterboro, S. C.
Lyday, W. H.—Greenville, S. C.
Lyles, W. B.—Spartanburg, S. C.
Lynch, K. M.—Charleston, S. C.
Lynch, W. S.—Lake City, S. C.

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McCalla, L. H.—Greenville, S. C.
McCants, C. S.—Winnsboro, S. C.
McCord, O. H.—Woodruff, S. C.
McCrady, R. L.—Charleston, S. C.
McCurry, W. E.—Ridge Spring, S. C.
McCutchen, G. T.—Columbia, S. C.
McDaniel, G. E.—Columbia, S. C.
McDaniel, W. Y.*—Taylors, S. C.
MacDonald, Roderick—Rock Hill, S. C.
McDowell, H. E.—Spartanburg, S. C.
McElroy, A. P.—Union, S. C.
McElroy, H. A.—Columbia, S. C.
McGill, W. K.—Clover, S. C.
McIlwain, W. L.—Belton, S. C.
McInnes, B. K.—Charleston, S. C.
McInnes, G. F.†—Charleston, S. C.
MacInnis, K. B.—Columbia, S. C.
McLawhorn, B. C.—Greenville, S. C.
McLean, J. W.—Greenville, S. C.
McLendon, S. B.—Columbia, S. C.
McLeod, James—Florence, S. C.
McLeod, F. H.*—Florence, S. C.
McMillan, C. B.—Lake View, S. C.
McMillan, L. M.—Mullins, S. C.
McNulty, R. B.—Columbia, S. C.
McWhorter, W. B.—Anderson, S. C.

Mabry, F. L.—Abbeville, S. C.
Mack, W. L.—Cordova, S. C.
Madden, L. E.—Columbia, S. C.
Maddox, Theo*—Union, S. C.
Maguire, D. L.*—Charleston, S. C.
Maguire, D. L., Jr.—Charleston, S. C.
Mamin, Harry—Columbia, S. C.
Martin, F. L.—Mullins, S. C.
Martin, F. N.—Charleston, S. C.
Martin, J. L.—Mullins, S. C.
Martin, J. W.—Anderson, S. C.
Martin, T. H.—Charleston, S. C.
Martin, T. W.—Belton, S. C.
Martin, W. T.—Goldville, S. C.
Massey, J. E.—Rock Hill, S. C.
Mathias, J. H.—Lexington, S. C.
Mathis, W. H.—North Augusta, S. C.
Matthews, D. N.—Columbia, S. C.
Matthews, J. H.—Elliott, S. C.
May, Chas. R.*—Bennettsville, S. C.
Mayer, O. B.†—Columbia, S. C.
Mays, W. C.—Fair Play, S. C.
Mazych, McM. K.*—Charleston, S. C.
Mead, Walter, R.—Florence, S. C.
Michaux, D. M.—Dillon, S. C.
Michaux, E. B.—Dillon, S. C.
Michie, D. E.—Marion, S. C.
Mikell, I. J.—Columbia, S. C.
Miles, Louis S.—Summerville, S. C.
Milford, J. C.—Anderson, S. C.
Milford, Lee—Clemson, S. C.
Miller, Ben*—Hickory Grove, S. C.
Miller, B. N.—Columbia, S. C.
Miller, C. J.—Inman, S. C.
Miller, S. E.†—State Park, S. C.
Milling, C. J.—Columbia, S. C.
Mills, J. H.—Mayesville, S. C.
Mills, W. E.*—Sumter, S. C.
Mims, J. L.—Lexington, S. C.
Mitchell, J. C.*—Charleston, S. C.
Mobley, C. A.—Orangeburg, S. C.
Mobley, M. R.—Florence, S. C.
Moncrief, W. H.—State Park, S. C.
Montgomery, B. M.—Kingstree, S. C.
Mood, G. McF.*—Charleston, S. C.
Mood, H. A.*—Sumter, S. C.
Moore, A. T.—Columbia, S. C.
Moore, E. H.—Newberry, S. C.
Moore, Geo. G.—McColl, S. C.
Moore, J. C.—Duncan, S. C.
Moore, J. C.—McColl, S. C.
Moore, M. S.—Charleston, S. C.
Moorman, V. R.†—Charleston, S. C.
Morgan, H. B.—Ware Shoals, S. C.
Morrall, S. A.—Graniteville, S. C.
Morehouse, W. G.—Spartanburg, S. C.
Morrison, C. W.—Lancaster, S. C.
Morrow, S. J.—Inman, S. C.
Mosteller, Malcolm—Columbia, S. C.
Munro, Catherine N.—Columbia, S. C.
Murray, J. G.—Greenville, S. C.

Nachman, M.—Greenville, S. C.
Neely, A. T.—Newberry, S. C.
Neidich, S.—Beaufort, S. C.
Neil, M. B.—Clover, S. C.
Nelson, M. L.—North, S. C.
Nesbitt, J. N.*—Gaffney, S. C.
Nesbitt, L. T.—Gaffney, S. C.
Newsom, R. M.—Ruby, S. C.
Nicholson, A. R.—Edgefield, S. C.
Nickles, M. B.—Laurens, S. C.
Niel, A. H.—Clover, S. C.
Nimmons, L. A.—Bishopville, S. C.
Noel, G. T.—Lancaster, S. C.
Northrop, T. M.—Greenville, S. C.
Norville, W. L.—Whitmire, S. C.

O'Driscoll, W. C.*—Charleston, S. C.
O'Hear, Jas., Jr.—Charleston, S. C.
Oliver, B. M.†—State Park, S. C.
Orr, J. E.—Seneca, S. C.
Owens, F. C.—Columbia, S. C.

Owings, F. P.†.....Union, S. C.
Oxner, C. E.....West Columbia, S. C.
O'Daniel, G. R.....Hartsville, S. C.

Pace, W. T.....Gray Court, S. C.
Palmer, J. S.....Allendale, S. C.
Parker, E. F.....Charleston, S. C.
Parker, F. L.*.....Charleston, S. C.
Parker, H. M.....Sumter, S. C.
Parker, J. D.....Greenville, S. C.
Parker, J. W., Jr.....Calhoun Falls, S. C.
Parker, Thos.†.....Greenville, S. C.
Parrish, M. E.....Sumter, S. C.
Patterson, V. P.....Chester, S. C.
Payne, P. E.....Columbia, S. C.
Pearce, J. C.....Graniteville, S. C.
Pearce, J. H.....Florence, S. C.
Pearson, A. S.....Woodruff, S. C.
Peek, D. E.....Six Mile, S. C.
Peel. Geo. T.....Anderson, S. C.
Peeples, G. S. T.....Charleston, S. C.
Peeples, M. I.....Greer, S. C.
Pepper, J. C.....Easley, S. C.
Perkins, R. H.....Laurens, S. C.
Perry, W. J.....Chesterfield, S. C.
Perry, Wm. L.....Chesterfield, S. C.
Pettus, W. J.....Charleston, S. C.
Phifer, I. A.....Spartanburg, S. C.
Pinner, C. A.....Peak, S. C.
Pittman, J. D.....Lancaster, S. C.
Pittman, J. G., Jr.....Gaffney, S. C.
Pittman, J. G., Sr.*.....Gaffney, S. C.
Pitts, L. W.....Columbia, S. C.
Pitts, T. A.....Columbia, S. C.
Plowden, H. H.....Columbia, S. C.
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Pollitzer, R. M.....Greenville, S. C.
Poole, Everett†.....Greenville, S. C.
Poole, R. Earle.....Spartanburg, S. C.
Poole, L. R.....Easley, S. C.
Pope, D. S.....Columbia, S. C.
Pope, T. H.....Newberry, S. C.
Porter, J. H.....Andrews, S. C.
Poston, W. H.....Pamplico, S. C.
Potts, Joe W.....Easley, S. C.
Powe, J. L.*.....Hartsville, S. C.
Powe, W. H.....Greenville, S. C.
Power, E. L.....Abbeville, S. C.
Power, J. R.....Abbeville, S. C.
Preacher, A. B.....Allendale, S. C.
Pressly, W. L.....Due West, S. C.
Preston, J. M.....State Park, S. C.
Price, F. R.....Charleston, S. C.
Price, Geo.†.....Spartanburg, S. C.
Price, Julian P.....Florence, S. C.
Price, W. H.....Charleston, S. C.
Prioleau, W. H.....Charleston, S. C.
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Pruitt, Olga V.....Anderson, S. C.
Pugh, Ruth Frank.....Spartanburg, S. C.
Purvis, O. H.....Cheraw, S. C.

Quantz, N. G.....Rock Hill, S. C.
Quattlebaum, J. T.....Columbia, S. C.

Rainey, J. F.....Anderson, S. C.
Ratliff, J. W.....Anderson, S. C.
Ravenel, J. J.....Charleston, S. C.
Ravenel, L. J.....Florence, S. C.
Ravenel, W. J.....Charleston, S. C.
Raysor, H. C.....St. Matthews, S. C.
Reeves, T. B.....Greenville, S. C.
Reid, S. D.....Chesnee, S. C.
Remsen, D. B.....Charleston, S. C.
Reynolds, T. W.....Charleston, S. C.
Rhame, D. O.....Clinton, S. C.
Rhame, G. S.....Camden, S. C.
Rhame, J. S.....Charleston, S. C.
Rhett, R. B.....Charleston, S. C.
Rhett, W. M.....Charleston, S. C.
Rhett, W. P.....Charleston, S. C.
Rhodes, F. K.....Florence, S. C.
Rice, M. M.*.....Columbia, S. C.
Rice, W. T.....Charleston, S. C.
Richards, G. P.....Charleston, S. C.
Richardson, L. L.*.....Simpsonville, S. C.
Rhinehart, V. W.....Walhalla, S. C.
Riser, L. A.....Greensboro, N. C.
Ritter, Adolph.....Ridgeland, S. C.
Rivers, A. L.....Charleston, S. C.
Robertson, H. C., Jr.....Charleston, S. C.
Rodgers, F. D.....Columbia, S. C.
Rogers, W. C.....Hemingway, S. C.
Roof, G. M. S.....Columbia, S. C.
Roper, C. P.....York, S. C.
Rose, Henry.....Greenville, S. C.
Rosenfeld, A. P.†.....Dillon, S. C.
Rourk, M. H.....Myrtle Beach, S. C.
Rourk, W. A.....Myrtle Beach, S. C.
Routh, F. M.....Columbia, S. C.
Royal, H. G.†.....Greenville, S. C.
Rubinowitz, B.....Columbia, S. C.
Rutledge, Edward*.....Charleston, S. C.
Rutledge, H. M.....Laurens, S. C.
Ryan, C. P.....Ridgeland, S. C.
Ryan, John.....Chesnee, S. C.
Ryan, Thos. E.....Chesnee, S. C.
Ryan, W. B., Jr.....Beaufort, S. C.

Salley, F. P.....Union, S. C.
Salters, L. B.....Florence, S. C.
Sanders, F. H.....Spartanburg, S. C.
Sanders, J. H.....Gaffney, S. C.
Sanders, J. O.....Anderson, S. C.
Sanders, P. W., Jr.....Charleston, S. C.
Sanders, R. L.....Columbia, S. C.
Sarratt, S. G.*.....Union, S. C.
Sasser, Jas. A.....Conway, S. C.
Sasser, Paul E.....Conway, S. C.
Saunders, J. L.....Greenville, S. C.
Saye, E. B.....Spartanburg, S. C.
Saye, J. H.*.....Sharon, S. C.
Saye, W. E.....Columbia, S. C.
Scarborough, A.....Greenville, S. C.
Scarborough, H. L.....Conway, S. C.

Scharlock, T. M.*—Charleston, S. C.
Schiffley, H. T.—Orangeburg, S. C.
Schneider, L. A.—Ninety Six, S. C.
Scott, C. M.—Darlington, S. C.
Scott, Jas. E.—Charleston, S. C.
Scott, J. E., Jr.—McClellanville, S. C.
Scott, W. S.—Spartanburg, S. C.
Scurry, C. J.—Greenwood, S. C.
Sease, J. C.—Newberry, S. C.
Seastrunk, J. G.—Columbia, S. C.
Seibels, R. E.—Columbia, S. C.
Seigle, B. I.—Rock Hill, S. C.
Senn, H. B.—Newberry, S. C.
Settle, H. G.—Fort Mill, S. C.
Settle, John M.—Charleston, S. C.
Setzler, J. B.—Columbia, S. C.
Sharpe, T. S.—Greenville, S. C.
Shaw, A. E.*—Columbia, S. C.
Shaw, F. G.—Camden, S. C.
Shaw, J. G.†—Columbia, S. C.
Shealy, F. K.—Clinton, S. C.
Shealy, K. D.—Columbia, S. C.
Shecut, L. C.—Orangeburg, S. C.
Sherard, S. B.*—Gaffney, S. C.
Sheridan, W. M.—Spartanburg, S. C.
Sheriff, Hilla—Columbia, S. C.
Shippey, S. H.—Rock Hill, S. C.
Siau, J. R.†—Georgetown, S. C.
Siegling, J. A.—Charleston, S. C.
Simmons, J. F.—Greenville, S. C.
Simmons, West—Greenville, S. C.
Simmons, W. H.—Charleston, S. C.
Simons, Sedgwick—Columbia, S. C.
Simpson, F. T.—Westminster, S. C.
Simpson, W. A.—Greenwood, S. C.
Simpson, W. E.—Rock Hill, S. C.
Smethers, A. L.—Anderson, S. C.
Smith, D. H.—Spartanburg, S. C.
Smith, D. L.*—Spartanburg, S. C.
Smith, D. L., Jr.—Spartanburg, S. C.
Smith, H. M.—Columbia, S. C.
Smith, Hugh—Greenville, S. C.
Smith, J. E.—Charleston, S. C.
Smith, Keitt†*—Greenville, S. C.
Smith, M. C.—Simpsonville, S. C.
Smith, T. H.—Bennettsville, S. C.
Smith, W. A.—Charleston, S. C.
Smyser, J. D.—Florence, S. C.
Snyder, W. J., Jr.—Sumter, S. C.
Sparkman, E. H.*—Charleston, S. C.
Sparkman, J. R.—Spartanburg, S. C.
Speissegger, C. A.*—Charleston, S. C.
Speissegger, W. H.—Charleston, S. C.
Spivey, C. G.—Columbia, S. C.
Steinberg, M.—Charleston, S. C.
Stevens, A. H.—Union, S. C.
Stevens, W. G.—Rock Hill, S. C.
Stith, R. B., Jr.—Florence, S. C.
Stokes, J. H.—Florence, S. C.
Stokes, L. M.—Walterboro, S. C.
Stoudenmire, D. C.—Honea Path, S. C.
Strait, W. F.—Rock Hill, S. C.
Strauss, D. D.—Bennettsville, S. C.
Strickland, W. A.*—Westminster, S. C.
Strong, E. E.—York, S. C.
Stroud, E. C.*—Marietta, S. C.
Stuckey, T. M.—Bamberg, S. C.
Stukes, L. C.—Summerton, S. C.
Sturkie, D. R.—North, S. C.
Sughrue, John—Charleston, S. C.
Sumner, Roy—Rock Hill, S. C.
Sweatman, C. A.—Columbia, S. C.
Switzer, P. K.—Union, S. C.
Swords, P. E.—Liberty, S. C.
Symmes, J. M.—Greenwood, S. C.
Symmes, T. H.—St. Matthews, S. C.

Taft, Robt. B.—Charleston, S. C.
Tate, J. V.*—Calhoun Falls, S. C.
Taylor, J. T.*—Adams Run, S. C.
Teague, J. H.*—Laurens, S. C.
Teague, M. M.—Laurens, S. C.
Temple, L. W.—Lakeview, S. C.
Temple, P. M.—Spartanburg, S. C.
Thackston, L. P.—Orangeburg, S. C.
Thomas, H. B.—Whitmire, S. C.
Thomas, J. D.—Loris, S. C.
Thomas, J. P.—Gaffney, S. C.
Thomason, E. H.—Olanta, S. C.
Thomason, J. A.—Fountain Inn, S. C.
Thompson, G. E.—Spartanburg, S. C.
Thompson, J. L.*—Columbia, S. C.
Thompson, M. A.*—Anderson, S. C.
Thompson, Wade—Anderson, S. C.
Timmerman, W. B.†—Hartsville, S. C.
Timmons, H. L.—Columbia, S. C.
Tolbert, S. W.—Columbia, S. C.
Townsend, E. W.—Charleston, S. C.
Townsend, J. F.*—Charleston, S. C.
Traywick, A. P.—Cameron, S. C.
Traywick, J. B.—Holly Hill, S. C.
Tripp, C. M.—Easley, S. C.
Truesdale, E. Z.—Bethune, S. C.
Truluck, G. M.—Orangeburg, S. C.
Tucker, E. W.—Johnston, S. C.
Tupper, E. D.—Summerville, S. C.
Turner, W. P.—Greenwood, S. C.
Tuten, W. R.—Fairfax, S. C.
Twitty, W. C.—Rock Hill, S. C.
Tyler, G. T., Jr.—Greenville, S. C.
Tyler, H. A.—Columbia, S. C.

Ulmer, J. G.—Hemingway, S. C.

Valley, J. L.*—Pickens, S. C.
Valley, T. P.—Pickens, S. C.
Van deErve, J., Jr.—Charleston, S. C.
Van deErve, John—Charleston, S. C.
Varner, J. W.—Kingstree, S. C.
Vincent, C. P.—Laurens, S. C.
VonLehe, J. A.—Walterboro, S. C.

Waddell, H. G.—Columbia, S. C.
Walker, D. E.*—Rock Hill, S. C.
Walker, G. D.—Johnston, S. C.
Walker, Howard—Spartanburg, S. C.

Walker, R. M.----Sumter, S. C.
Walker, Wm. Hamilton†----Charleston, S. C.
Wall, Lee J.*----Easley, S. C.
Wallace, W. R.----Chester, S. C.
Wagner, H. P.----Charleston, S. C.
Walsh, J. N.----Monks Corner, S. C.
Ward, J. L.----Greenwood, S. C.
Ward, W. B.----Rock Hill, S. C.
Waring, Joe I.----Charleston, S. C.
Warner, W. P.----Greenville, S. C.
Watkins, J. O.----Spartanburg, S. C.
Watson, A. C.----Greenville, S. C.
Watson, J. B.----Columbia, S. C.
Way, Roger†----Spartanburg, S. C.
Webb, J. K.----Great Falls, S. C.
Webb, J. N.----Seneca, S. C.
Webb, M. W.----Wagener, S. C.
Welbourne, Edythe----Columbia, S. C.
Wellbrock, W. L. A.†----Charleston, S. C.
Welling, A. W.†----Newberry, S. C.
Wells, Leon----Holly Hill, S. C.
West, C. A.----Camden, S. C.
Weston, I'On----Mullins, S. C.
Weston, Wm., Jr.----Columbia, S. C.
Weston, Wm.*----Columbia, S. C.
Westrope, G. R.----Gaffney, S. C.
Wheeler, S. E.----Columbia, S. C.
Whetsell, W. O.----Orangeburg, S. C.
Whitaker, A. B.----Camden, S. C.
White, E. P.----Columbia, S. C.
White, J. W.----Greenville, S. C.
Whitesides, W. C.----York, S. C.
Whitley, W. E.----Andrews, S. C.
Whitlock, W. A., Jr.----Aiken, S. C.
Whitten, B. O.----Clinton, S. C.
Whitworth, H. M.†----Greenville, S. C.
Wild, W. W.----N. Charleston, S. C.
Wilds, E. L.----Anderson, S. C.
Wilds, R. H.----Aiken, S. C.
Wiley, W. R.----Chesterfield, S. C.
Wilkinson, G. R.----Greenville. S. C.
Willcox, J. M.----Darlington, S. C.
Williams, C. F.*----Columbia, S. C.
Williams, H. B.----Columbia, S. C.
Williamson, J. P.----Ware Shoals, S. C.
Willis, A. E.----Orangeburg, S. C.
Willis, H. A.----Monks Corner, S. C.
Willson, J. O.----Spartanburg, S. C.
Wilson, H. F.†----Columbia, S. C.
Wilson, I. R., Jr.†----Charleston, S. C.
Wilson, I. R.----Charleston, S. C.
Wilson, L. A.----Charleston, S. C.
Wilson, O. B.----Spartanburg, S. C.
Wilson, Robt., Jr.----Charleston, S. C.
Wilson, Robt.*----Charleston, S. C.
Wilson, T. R. W.----Greenville, S. C.
Windley, W. H.----Myrtle Beach, S. C.
Winter, D. O.----Sumter, S. C.
Woodruff, P. E.†----Pickens, S. C.
Woodruff, W. A.----Woodruff,, S. C.
Woods, J. F.----Columbia, S. C.
Workman, B. J.----Woodruff, S. C.
Workman, C. H.----McCormick, S. C.
Workman, J. B.----Ware Shoals, S. C.
Wrenn, Frank----Anderson, S. C.
Wyatt, C. N.†----Greenville, S. C.
Wyatt, E. F.*----Easley, S. C.
Wylie, A. M.*----Chester, S. C.
Wyman, B. F.----Columbia, S. C.
Wyman, H. E.----Columbia, S. C.
Wyman, H. H.----Aiken, S. C.
Wyman, M. H.----Columbia, S. C.

Young, C. H.----Anderson, S. C.
Young, J. H.----Columbia, S. C.
Young, L. Lee*----Clinton, S. C.
Young, J. P.*----Chester, S. C.
Young, J. P.----N. Charleston, S. C.
Young, J. R.----Anderson, S. C.

Zeigler, R. F., Jr.----Seneca, S. C.
Zemp, F. E.----Columbia, S. C.
Zerbst, G. M.----Sumter, S. C.
Zimmerman, W. S.----Spartanburg, S. C.

† following name indicates serving in armed forces.
* following name indicates honorary fellowship.